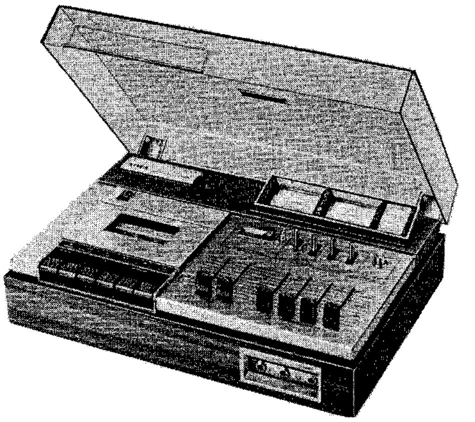
STEREO CASSETTE DECK WITH DOLBY SYSTEM AND DNL

MODEL AD-1800 EE, UK

AIWA®

[SERVICE MANUAL]



Set using ISO screws

DATE OF ISSUE 25/12/1975

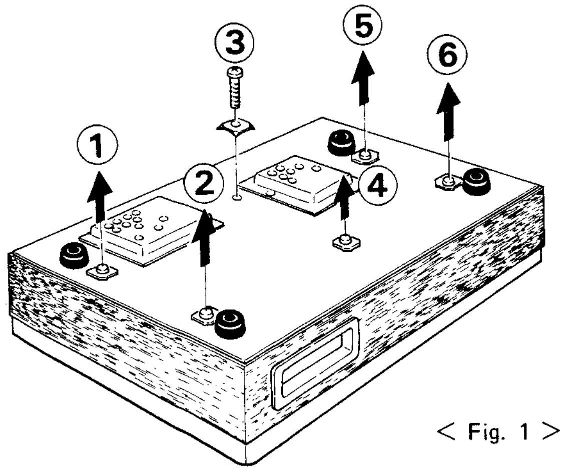
SPECIFICATIONS

Type:	Hi-Fi stereo cassette tape deck with Dolby system and DNL
Recording track system:	4-track, 2-channel
Circuit:	1 IC, 62 transistors, 43 diodes, 2 FET, 3 LED
Power source:	**"EE" model** AC 110 ~ 120V/220 ~240V switch changeable, 50/60 Hz **"UK" model** AC 120V/240V switchable 50 Hz
Power consumption:	24W
Frequency response:	LH tape, 30 ~ 14,000 Hz Fe-Cr tape, 30 ~ 18,000 Hz CrO_2 tape, 30 ~ 17,000 Hz
SN ratio:	65 dB (Dolby NR/DNL ON, Fe-Cr tape)
Wow & flutter:	0.05% (WRMS)
Tape speed:	4.76 cm/sec. (1-7/8 ips) ±1.0%
Recording system:	AC bias
Erasing system:	AC erase
Rewind time:	95 sec. (w/ C-60)
FF time:	95 sec. (w/ C-60)
Usable cassette tape:	C-30, C-60, C-90, (C-120)
Motor:	AC hysterrisis synchronous motor
Head:	Ferrite guard head (FGH)
Input:	
MIC:	Max. input sensitivity: 0.25 mV Impedance: 200 ohms ~ 10k ohms
LINE (IN):	Max. input sensitivity: 50 mV Impedance: 100 k ohms or higher
DIN (IN):	Max. input sensitivity: 0.1mV/k ohm Impedance: 2.7 k ohms
Output:	
LINE (OUT):	Standard output level: 0.775V (0 VU) Optimum load impedance: 50 k ohms or higher
DIN (OUT):	Standard output level: 0.775V (0 VU) Optimum load impedance: 50 k ohms or higher
Headphone:	Load impedance: 8 ohms
Dimensions (w.h.d):	423 x 152 x 295 mm (with dust cover)
Weight:	7.5 kg (with dust cover)
Accessories:	Dust cover x 1 Tape cassette x 1 DIN cord x 1 Head cleaning pole x 1

- The external design and the specifications are subject to change without prior notice.
- Dolby Noise Reduction Circuit Under License from Dolby Laboratories Incorporated.
- The word "Dolby" and "Double-D" symbol are trademarks of Dolby Laboratories Incorporated.

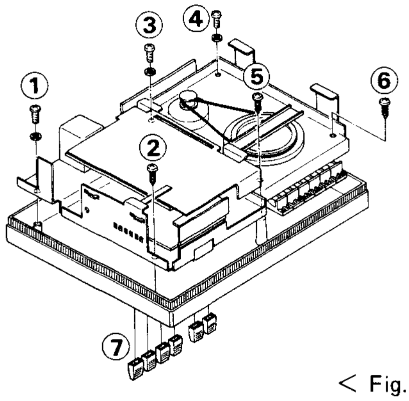
DISASSEMBLY INSTRUCTIONS

1. **To Remove Wooden Cover**
   (1) Remove six screws, (1) through (6).
   (Refer to Fig. 1)



< Fig. 1 >

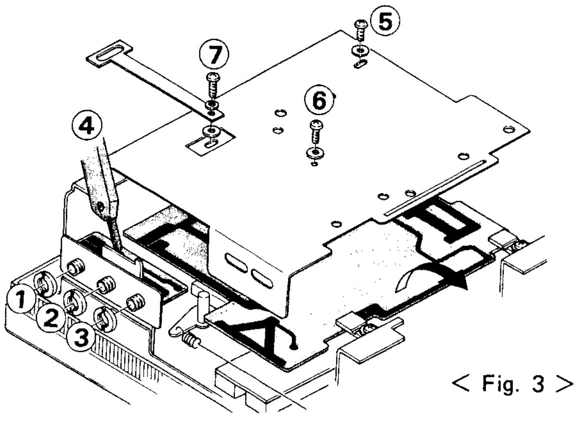
2. **To Remove Chassis**
   (1) Pull off the six control knobs. (7)
   (2) Remove six screws, (1) through (6).
   (Refer to Fig. 2)



< Fig. 2 >

3. **To Remove Jack-1 Circuit Board**
   (1) Remove three nuts ((1) through (3)) and unsolder lead of capacitor (4). (Refer to Fig. 3)

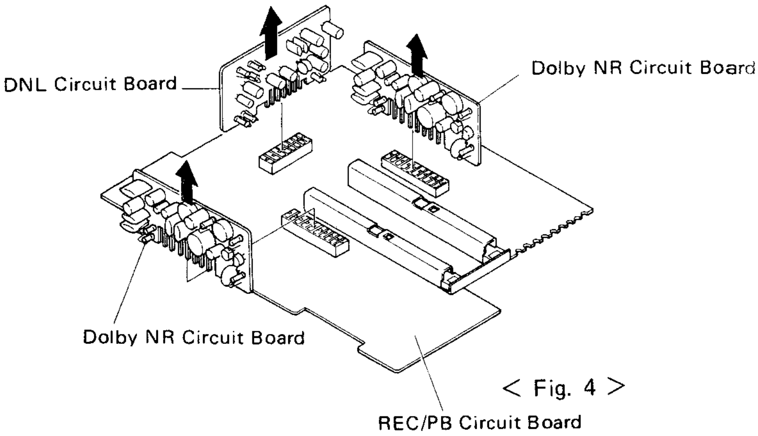
4. **To Remove Rec./Pb Circuit Board**
   (1) Remove three screws, (5) through (7).
   (Refer to Fig. 3)



< Fig. 3 >

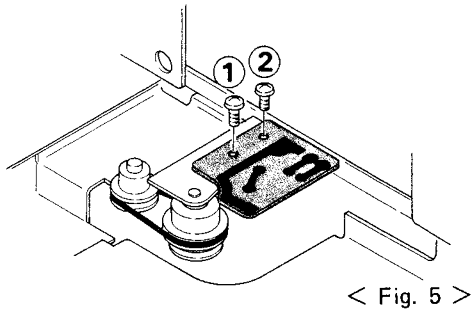
5. **To Remove Dolby-NR Circuit Board.**
   (1) Pull off the Dolby-NR circuit board.
   (Refer to Fig. 4)

6. **To Remove DNL Circuit Board**
   (1) Pull off the DNL circuit board.
   (Refer to Fig. 4)


DNL Circuit Board
Dolby NR Circuit Board
Dolby NR Circuit Board
REC/PB Circuit Board

< Fig. 4 >

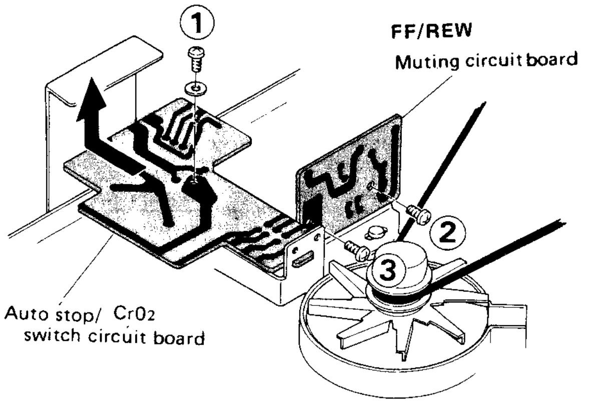
7. **To Remove Auto-Stop Detectron Circuit Board.**
   (1) Remove two screws, (1) and (2).
   (Refer to Fig. 5)



< Fig. 5 >

8. **To Remove Auto-Stop/CrO$_2$ Switch Circuit Board**
   (1) Remove one screw (1).
   (Refer to Fig. 6)

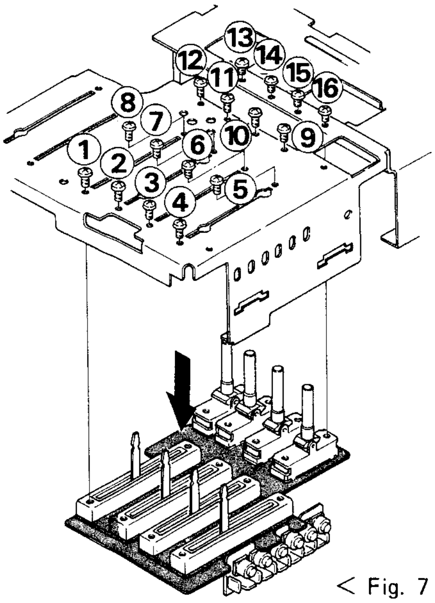
9. **To Remove FF/REW Muting Circuit Board**
   (1) Remove two screws, (2) and (3).
   (Refer to Fig. 6)


①
FF/REW
Muting circuit board
②
③
Auto stop/ CrO2
switch circuit board

< Fig. 6 >

10. To Remove Switch/Volume Circuit Board

(1) Remove sixteen screw, (1) through (16).
(Refer to Fig. 7)



< Fig. 7 >

11. To Remove LAMP Circuit Board

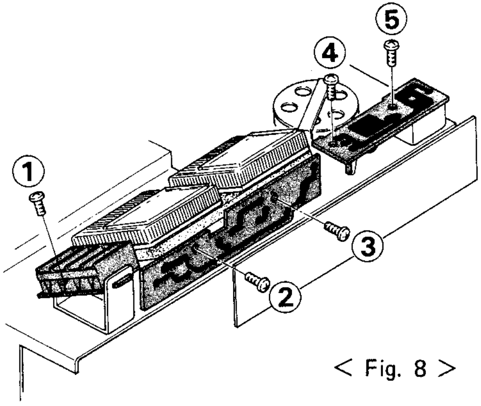
(1) Remove one screw, (1).
(Refer to Fig. 8)

12. To Remove Meter Circuit Board

(1) Remove two screws, (2) and (3).
(Refer to Fig. 8)

13. To Remove Bias Osc Circuit Board

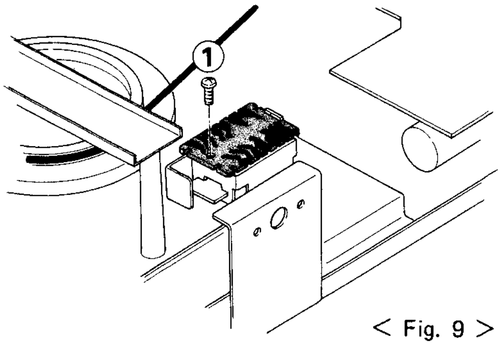
(1) Remove two screws, (4) and (5).
(Refer to Fig. 8)



< Fig. 8 >

14. To Remove Stop Muting Circuit Board

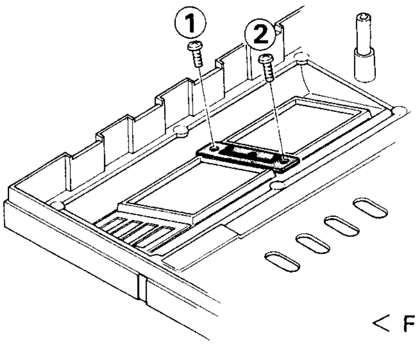
(1) Remove one screw (1).
(Refer to Fig. 9)



< Fig. 9 >

15. To Remove LED Circuit Board

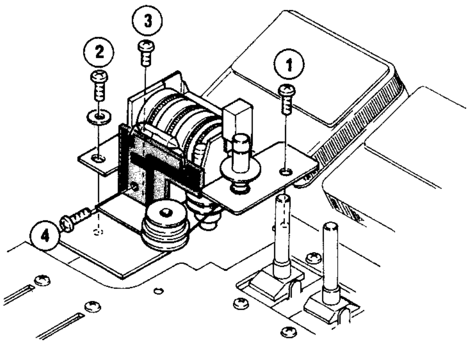
(1) Remove two screws, (1) and (2).
(Refer to Fig. 10)



< Fig. 10 >

16. To Remove Counter Lamp Circuit Board

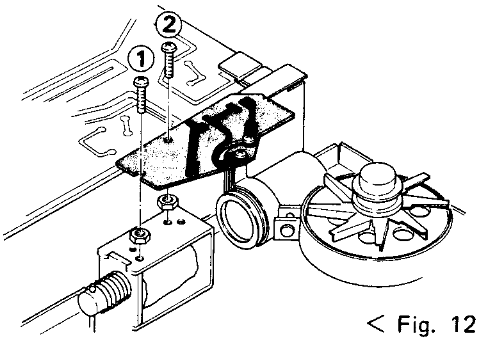
(1) Remove four screws, (1) through (4).
(Refer to Fig. 11)



< Fig. 11 >

17. To Remove Motor Circuit Board

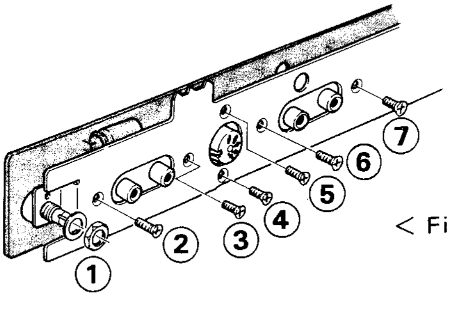
(1) Remove two screws, (1) and (2).
(Refer to Fig. 12)



< Fig. 12 >

18. To Remove Jack-2 Circuit Board

(1) Remove the nut and washer (1).
(2) Remove six screws, (2) through (7).
(Refer to Fig. 13)

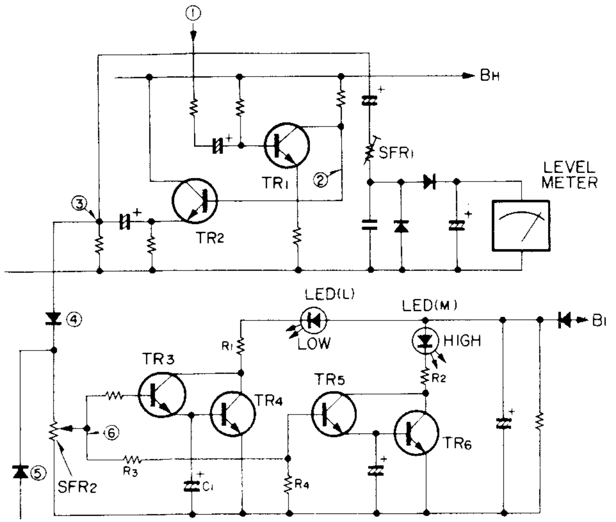


< Fig. 13 >

NEW CIRCUIT DESCRIPTION

2. Point Peak Indicators

- **Peak indicator circuit diagram**



< Fig. 14 >

Presently employed VU meters are capable of indicating continuous wave signals of approximately 300msec. They are incapable of following faster pulse type signals however, resulting in an indicated value considerably lower than the actual level. Thus if the recording level is set in reference to the VU meters, an instantaneous high level input can cause an over level, resulting in distortion.

Peak indicators are provided for preventing this situation and are capable of indicating to about 1msec instantaneous inputs. Earlier single point designs (a single peak indicator which lights at +6VU) however, were ambiguous and difficult to interpret. The indicator was not supposed to light, but if it did not light, the level could not be determined.

The 2 point peak indicator system employed in the AD-1800 represents an improvement over earlier systems. Two peak indicators are used with different lighting levels (+2.5~3VU and +6~7VU), allowing more accurate peak indication.

- **Circuit Description**

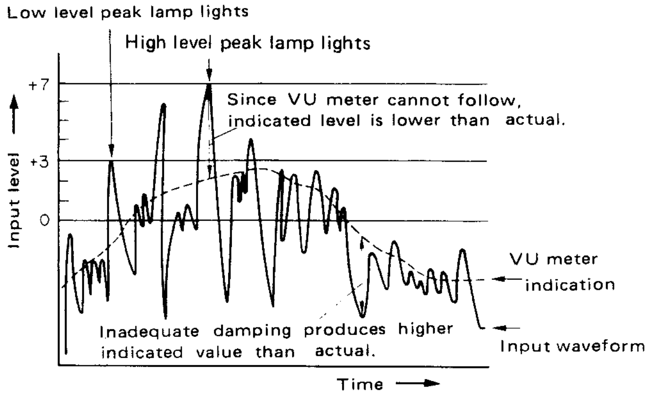
Input signal (1) is amplified approximately 10dB by TR1. Previously, it passed from (2) through the SFR and was rectified and connected to the meter. However, since the meter load is heavy, TR1 output voltage became varied by SFR adjustment, preventing connection to the peak indicator circuit.

TR2 is therefore inserted at that point as an emitter follower, reducing meter amplifier output impedance in order not to influence meter and peak indicators.

The signal to the meter amplifier is divided at (3). The peak indicator signal is rectified at (4) and the voltage is applied to SFR2. At this point the signal from the other channel is mixed, while the peak indicator lighting level is determined by adjusting SFR2.

When (6) reaches a specified voltage, TR3 and TR4 Darlingtons become on, and LED (L) lights. C1 is inserted at this point to provide a certain degree of lighting time, since instantaneous lighting with a pulse signal input would be difficult to observe.

The voltage at (6) is divided at R3 & R4. By a higher level than TR3 on level, TR5 and TR6 become on. R1 and R2 are inserted as protector resistors to control the current flow through the LED.



< Fig. 15 >

- **Recording Level Settings According to Tape**

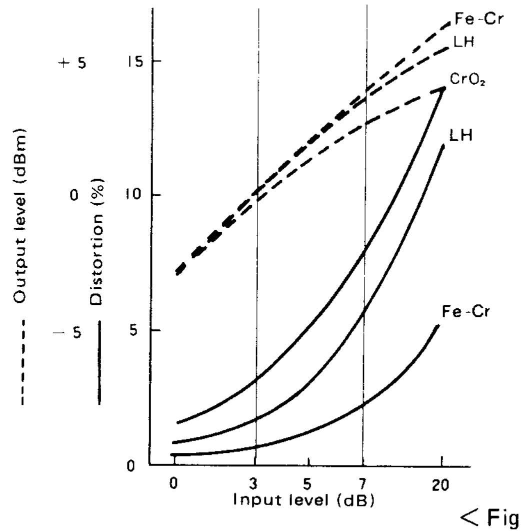
Distortion can be suppressed to below 3% and optimum recording performed by setting the recording levels as follows.

LH Tape: Lights occasionally at +3dB; does not light at +7dB

Fe-Cr Tape: Lights often at +3dB; lights occasionally at +7dB

CrO_2 Tape: Does not light at either +3dB or +7dB

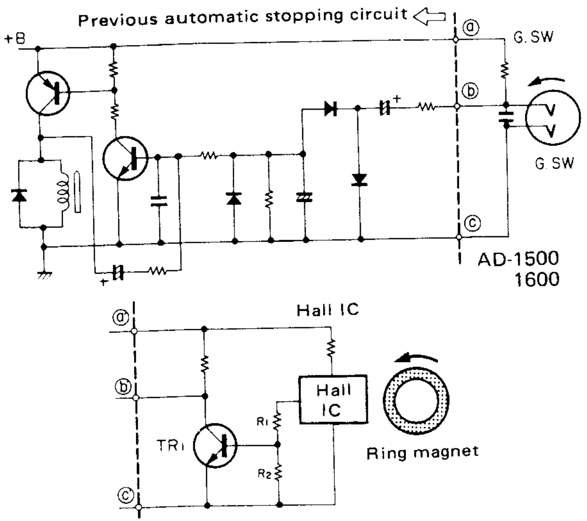
Input and output level distortion characteristics



< Fig. 16 >

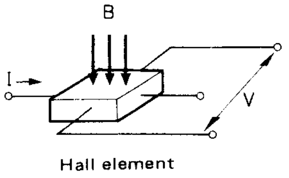
■ Hall IC Tape End Detector Circuit

In order to remedy the drawbacks (noise, life, maintenance, etc.) of earlier mechanical contact type tape end detectors (G. switch and reed switch), a magnet and Hall IC are employed in the AD-1800.


Previous automatic stopping circuit
+B
ⓐ
G.SW
ⓑ
V
V
G SW
ⓒ
AD-1500
1600
Hall IC
ⓐ
ⓑ
Hall IC
R1
TR1
R2
ⓒ
Ring magnet
AD-1800

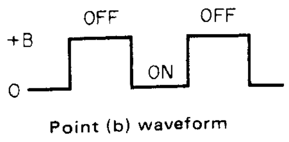
< Fig. 17 >

- **Automatic Stopping Circuit Diagram**
When a magnetic field is applied at right angles to the current flow in a Hall element, an emf (Hall voltage) becomes generated at right angles to the magnetic field and current flow. As the output of the Hall element is small (0.3V at I = 20mA, B = 1000 Gauss), the AD-1800 element is incorporated into an IC amplifier (more than 2.5V at Icc = 13.5mA, B = 350 Gauss).

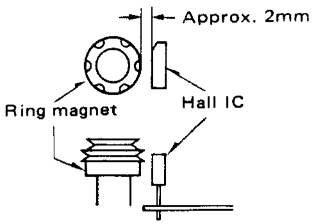

B
I
V
Hall element

< Fig. 18 >

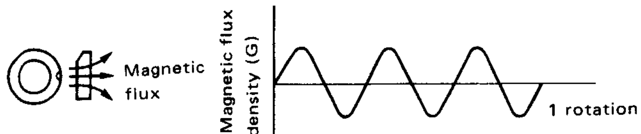
- **Operating Description**
The waveform at point (b), shown in Fig. 19, pertains to previous automatic stopping circuits. An identical waveform can also be obtained from a ring magnet and Hall IC.
Six magnetic poles are provided at the outer circumference of the ring magnet, producing more than 500 Gauss at 2mm from the outer circumference. The magnetic flux pattern through 1 rotation of the ring magnet is shown in Fig. 21.



< Fig. 19 >

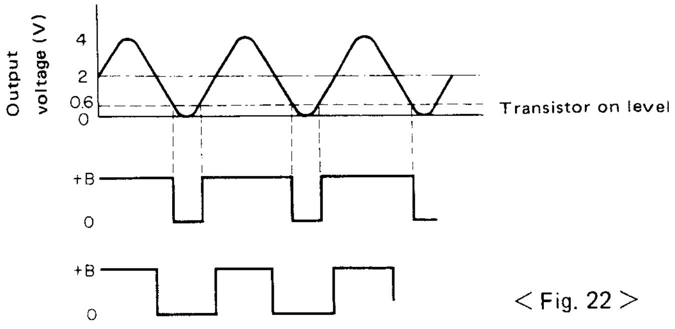

Approx. 2mm
Ring magnet
Hall IC
Circuit board

< Fig. 20 >



< Fig. 21 >

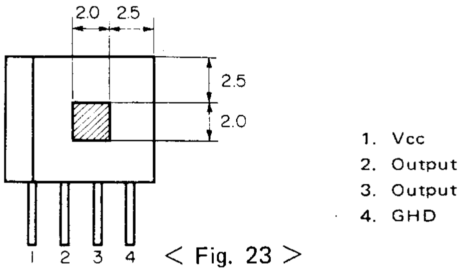
The flux variation through ring magnet rotation (coupled with counter pulley rotation) imparted to the Hall IC results in an output as shown in Fig. 22.



< Fig. 22 >

If this voltage were applied directly to TR1 base, the transistor on and off times would differ, since the voltage is 2V even with 0 magnetic flux. R1 and R2 perform dividing in order to equalize on and off times. TR1 collector output voltage waveform (at b) becomes the waveform applied to (b).

- **Hall IC Handling Cautions**
The Hall element is located within the IC as illustrated in Fig. 23. If the magnet position becomes disturbed, or its distance increased, the IC output declines. Caution is therefore needed.


2.0
2.5
2.5
2.0
1. Vcc
2. Output 1
3. Output 2
4. GHD
1
2
3
4

< Fig. 23 >

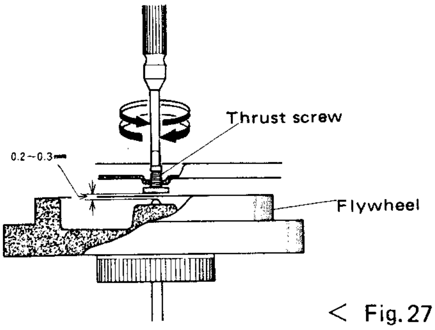
Specified position is approximately 2mm from magnet.

ADJUSTMENTS

■ Mechanical Section

1. Thrust Adjustment

1) Turn thrust screw to move flywheel assembly vertically to obtain 0.2~0.3mm thrust. (Refer to Fig. 27).

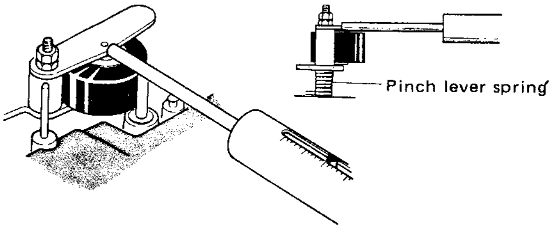

Thrust screw
0.2~0.3mm
Flywheel

< Fig.27 >

2. Pinch Pressure

1) With set in play mode, apply 500g cylindrical tension gage to pinch lever center. Press slowly and measure pinch pressure when pinch roller separates from capstan. (Refer to Fig. 28).

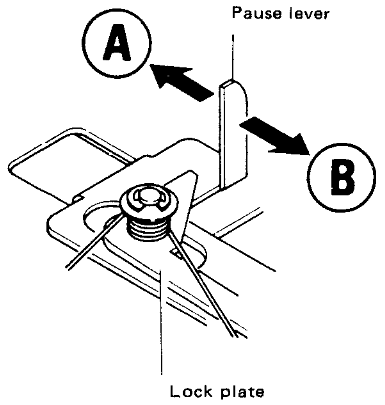
Rating: 400 ±50g


Pinch lever spring

< Fig. 28 >

3. Pause Timing

1) Press FWD button for play mode, then slowly press pause button. Observe stopping times of take up reel hub and pinch roller rotations.
2) If pinch roller quickly separates from capstan, while tape is running, adjust by bending pause lever in direction B.
3) If pinch roller separation is delayed and tape winds onto pinch roller without take up reel hub rotation, adjust by bending pause lever in direction A. (Refer to Fig. 29).

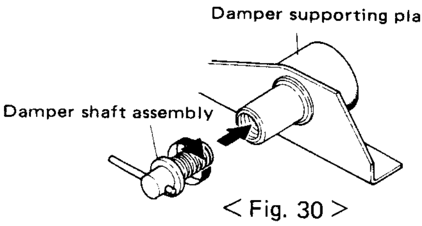

A
Pause lever
B
Lock plate

< Fig. 29 >

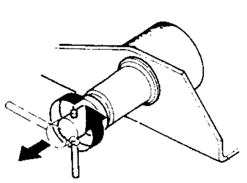
4. Supporting Plate Assembly Adjustments

4-1 Damper Adjustments

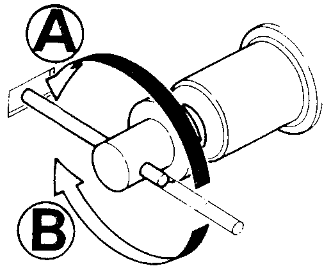
1) Screw damper shaft assembly fully into damper supporting plate assembly (Refer to Fig. 30).
2) When damper shaft assembly is turned 2 rotations clockwise, observe that shaft pin becomes positioned toward square hole of supporting plate (Refer to Fig. 31).
3) If shaft pin is in range A, turn counter-clockwise to adjust; if in range B turn clockwise (Refer to Fig. 32).


Damper supporting plate assembly
Damper shaft assembly

< Fig. 30 >



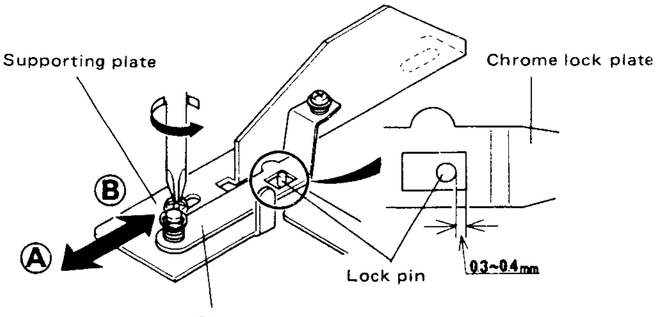
< Fig. 31 >



< Fig. 32 >

4-2 Supporting Plate Adjustment

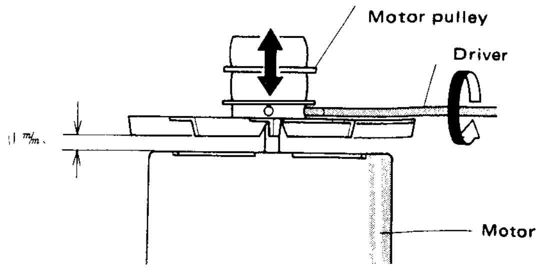
1) Lock pin of tape selector lever should engage with chrome lock plate when cassette elevating plate raises during eject. Loosen supporting plate screw and adjust by moving in A-B direction. Adjust so that lock pin spacing from right side of chrome plate square hole becomes 0.3~0.4mm (Refer to Fig. 33).


Supporting plate
Chrome lock plate
B
A
Lock pin
0.3~0.4mm
Chrome lock plate

< Fig. 33 >

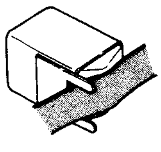
5. Motor Pulley Thrust

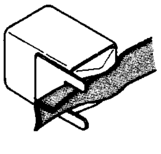
1) Adjust by raising or lowering motor pulley so that space between pulley rim and motor becomes 1mm (Refer to Fig. 34).

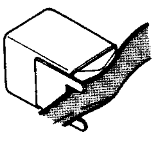

Motor pulley
Driver
1 m/m
Motor

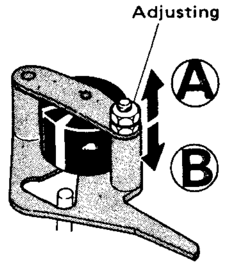
< Fig. 34 >

6. **Tape Running**
   1) Adjust so that tape does not contact tape guide when running (Refer to Fig. 35).
   2) If tape contacts upper portion of guide (Fig. 36), move adjusting nut in direction A (Refer to Fig. 38).
   3) If tape contacts lower portion of guide (Fig. 37), move adjusting nut in direction B (Refer to Fig. 38).


< Fig. 35 >

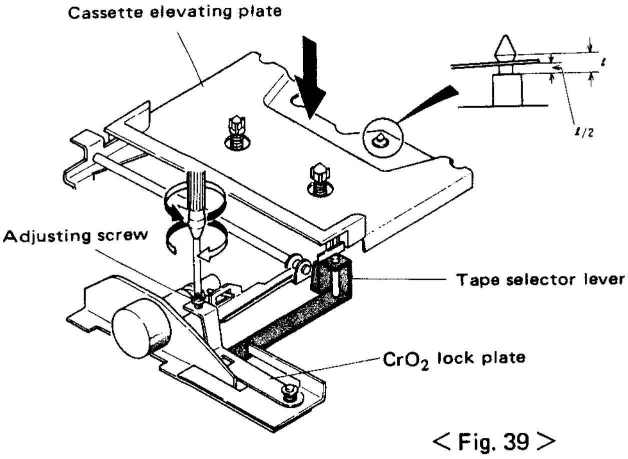

< Fig. 36 >


< Fig. 37 >



< Fig. 38 >

7. **CrO_2 Lock Plate**
   1) Confirm that CrO_2 lock plate separates from tape selector lever when cassette elevating plate is in 1/2 range.
   2) If it fails to separate, adjust by turning CrO_2 lock plate adjusting screw clockwise or counter-clockwise to obtain separation in the 1/2 range. Apply screw locking compound after adjusting. (Refer to Fig. 39)



< Fig. 39 >

8. **Tape Speed**
   3kHz ±1%
   Use a standard test tape, TTA-111A (3kHz) or equivalent.

9. **Wow and Flutter**
   0.05% (WRMS) at PB
   Use a standard test tape, TTA-11A (3kHz) or equivalent.

10. **Take-up Torque**
    40 ~ 60g-cm

11. **FF and Rewind Torque**
    90 ~ 160g-cm

12. **FF and Rewind Time**
    90 ±10 sec. (at C-60 cassette tape)

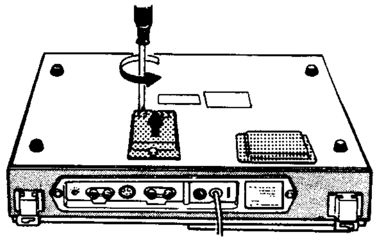
13. **Automatic shut-off Time**
    4 ±1 sec.

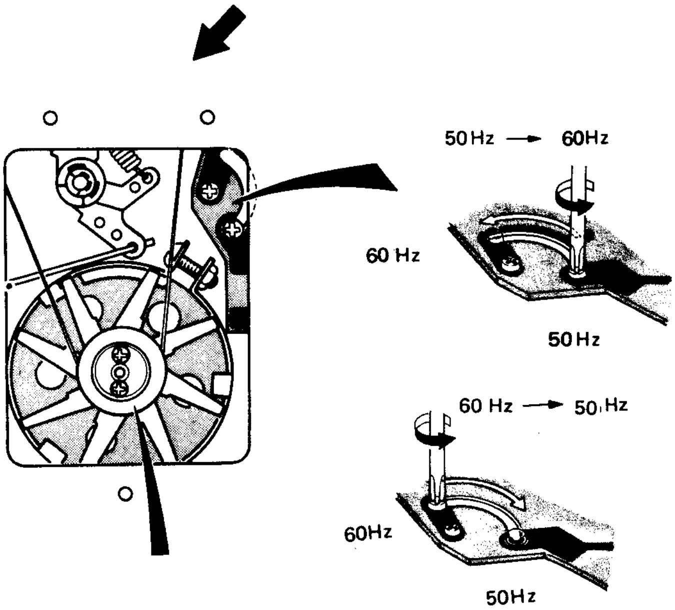
CYCLE CONVERSION

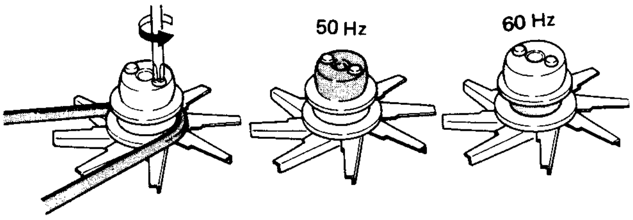
Conversion Steps

1. Observe that POWER switch is OFF and AC cord unplugged from power outlet.
2. Turn the set upside down, take out 3 screws from the motor cover, and remove the motor cover.
3. Disengage belt from motor pulley and temporarily position it on the motor fan securing screw.
4. Take out 2 motor pulley setscrews and remove motor pulley.
5. Turn motor pulley upside down and reinstall it with setscrews.
6. Engage belt on lower portion of motor pulley.
7. Install motor cover.

- The thicker side of the motor pulley upward is for 60 Hz operation, while for 50 Hz operation, the thinner side of the pulley should be upward.







ADJUSTMENTS

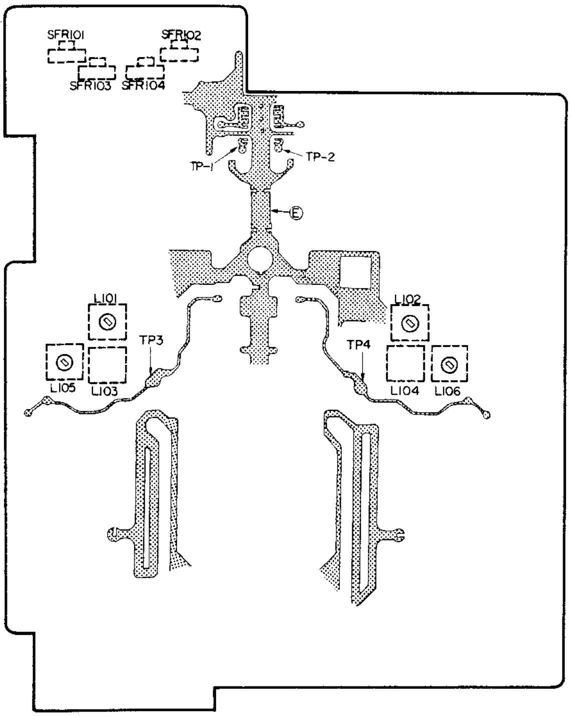
■ ELECTRICAL SECTION

- **Preparations for Adjustment**

1. **Required Equipment**
    - Low frequency oscillator (signal generator)
    - Variable resistance attenuator
    - VTVM
    - Oscilloscope
    - Resistors: 600Ω, 100kΩ, 27kΩ, 5.6kΩ
    - Test tapes: TTA-117E/TTA-161/TTA-119D (CrO_2)/TTA-119E (FeCr)/TTA-119A (LH)

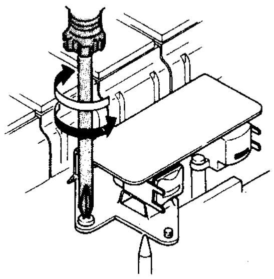
2. **Adjustment Cautions**
    1) Before adjusting, clean heads, capstan and pinch roller with gauze moistened in alcohol.
    2) Demagnetize record/play head with head eraser.
    3) Thoroughly demagnetize adjusting driver.
    4) Set playback volume to maximum.
    5) Except where otherwise indicated, set DOLBY-NR and DNL switches to OFF, employ MIC jacks for input and LINE OUT for output.
    6) Standard inputs (0dB = 0.775V)
       MIC Jack: 65dB
       LINE-IN: 20dB
    7) Connect 100kΩ load resistor to LINE-OUT.

- **Main Component Locations**



PLAYBACK ADJUSTMENTS

1. **Azimuth**
   TAPE SELECTOR: CrO_2
   Play 10kHz portion of test tape TTA-117E (CrO_2) and turn azimuth adjusting screw to obtain maximum output from left and right channels.
   Do not rotate screw more than 1/4 turn.
   After adjusting, apply locking compound to screw.



2. **Playback Frequency Response**
   TAPE SELECTOR: CrO_2
   Play test tape TTA-117E (CrO_2) and adjust high frequency trimmer resistor SFR101 for equal outputs at 1kHz and 10kHz. In the same manner, adjust SFR102 for the right channel.
   Rating: 1kHz~10kHz flat

3. **Level Meters**
   With set in record mode, apply 400Hz ±25dB signal. Adjust LINE IN volume for 580mV output from TP-3.
   Adjust meter trimmer resistor SFR201 so that level meter indicates the Dolby mark. In the same manner, measure TP-4 and adjust SFR202 for the right channel.

4. **Playback Level**
   TAPE SELECTOR: LH
   Play test tape TTA-161 and adjust playback output trimmer resistor SFR103 so that level meter indicates the Dolby mark. In the same manner, adjust SFR104 for the right channel.

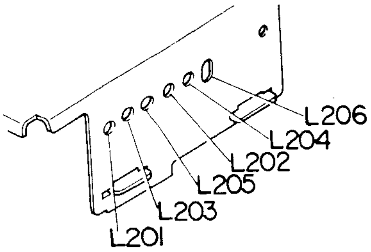
RECORDING ADJUSTMENTS

1. **Bias Trap Coil**
   TAPE SELECTOR: CrO_2
   With set in recording mode, adjust trap coil L107 for minimum voltage at test point TP-5. In the same manner, measure TP-6 and adjust L108 for the right channel.

2. **Dolby Trap Coil**
   TAPE SELECTOR: CrO_2
   With set in recording mode, adjust Dolby trap coil L101 for minimum bias leakage to LINE OUT. In the same manner, adjust L102 for the right channel.

3. **Bias Current**
   TAPE SELECTOR: CrO_2
   With set in recording mode, adjust bias current trimmer TC701 for 2mV (200μA) voltage at test point TP-1. In the same manner, measure TP-2 and adjust TC202 for the right channel.
   Rating: 2mV (200μA)

4. Record/Playback Frequency Response



1) **CrO_2**

TAPE SELECTOR: CrO_2
Test Tape: TTA-119D

Apply 500Hz (−25dB) signal via LINE IN jack and adjust line volume for 77.5mV output at LINE OUT. Record 500Hz and 5kHz signals on test tape TTA-119D and play back. Confirm that the 1kHz level is within ±0.5dB in respect to the 500Hz level.

If the 5kHz level is higher, set the bias current higher than 2mV.

If the 5kHz level is lower, set the bias current lower than 2mV

Perform adjustment in the same manner as described in Step 3 Bias Current adjustment.

Record and play back 500Hz, 5kHz, 10kHz and 15kHz signals. Adjust CrO_2 hi peaking coil L201 so that with respect to the 500Hz signal, 5kHz and 10kHz become within ±0.5dB and 15kHz within ±1dB. In the same manner, adjust L202 for the right channel.

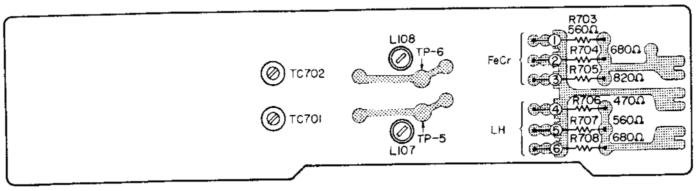
2) **Fe-Cr**

Test Tape: TTA-119E
TAPE SELECTOR: Fe-Cr

Record and play back with TTA-119E test tape as described for CrO_2 in step 1. If results are not within ratings, adjust as follows.

Playback Level (1kHz ref.)	Connection	Bias Voltage
5kHz level higher	(1)	Increases
5kHz level lower	(3)	Decreases

Short one of the circuit patterns among 1~3.



Record and play back 500Hz, 10kHz and 15kHz signals. Adjust FeCr hi peaking coil L203 so that with reference to the 500Hz level, 10kHz becomes within ±0.5dB and 15kHz within ±1dB. In the same manner, adjust L204 for the right channel.

3) **LH-NORMAL**

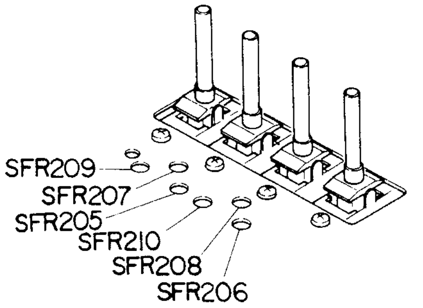
Test Tape: TTA-119A
TAPE SELECTOR: LH-NORMAL

Record and play back with TTA-119A test tape as described for CrO_2 in step 1. If results are not within ratings, adjust as follows.

Playback Level (1kHz ref.)	Connection	Bias Voltage
5kHz level higher	(4)	Increases
5kHz level lower	(6)	Decreases

Record and play back 500Hz and 10kHz signals. Adjust LH hi peaking coil L205 so that with reference to the 500Hz level, 10kHz becomes within −1.5 +1dB. In the same manner, adjust L206 for the right channel.

5. Record/Playback Level



1) **CrO_2**

Test Tape: TTA-119D
TAPE SELECTOR: CrO2

With set in recording mode, apply 2kHz 77.5mV signal. Record and play back this signal on TTA-119D test tape. Adjust CrO_2 recording current trimmer resistor SFR205 so that playback level becomes 77.5mV ±0.25dB. In the same manner, adjust SFR206 for the right channel.

2) **Fe-Cr**

Test Tape: TTA-119E
TAPE SELECTOR: Fe-Cr

Employ TTA-119E test tape and perform the same operation as for CrO_2 above. Adjust SFR207 for the left channel, and SFR208 for the right channel.

3) **LH-NORMAL**

Test Tape: TTA-119A
TAPE SELECTOR: LH-NORMAL

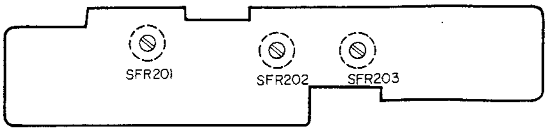
Employ TTA-119A test tape and perform the same operation as for CrO_2. Adjust SFR209 for the left channel, and SFR210 for the right channel.

6. Peak Indicator

With set in record mode, apply 1kHz −27dB signal. Adjust LINE IN volume for OVU indication on level meter. Set attenuator to −21dB (level meter indicates +6dB) and turn the peak indicator trimmer resistor SFR203 to the point where the red peak indicator just extinguishes.

Next set attenuator to −20dB and confirm that red indicator lights. Vary attenuator in the −24dB area and read the value at the point where yellow indicator just extinguishes.

Rating: −25dB ±1.5dB

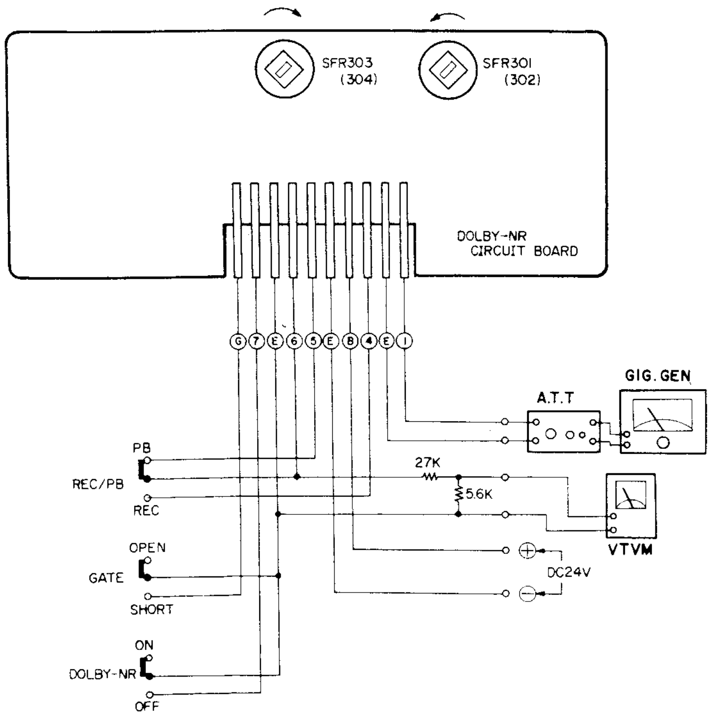


7. MPX Filter

With set in record mode, apply 19kHz signal to LINE IN. Adjust LINE IN volume for 0.77V at LINE OUT. With MPX filter switch of Dolby NR ON, adjust MPX filter coil L105 so that 19kHz signal becomes less than −30dB. In the same manner, adjust L106 for the right channel.

DOLBY NR ADJUSTMENTS

- **Main Component Locations and Connections**


SFR303
(304)
SFR301
(302)
DOLBY-NR
CIRCUIT BOARD
G 7 E 6 5 E 8 4 E 1
GIG. GEN
A.T.T
PB
REC/PB
REC
27K
5.6K
VTVM
OPEN
GATE
SHORT
DC24V
ON
DOLBY-NR
OFF

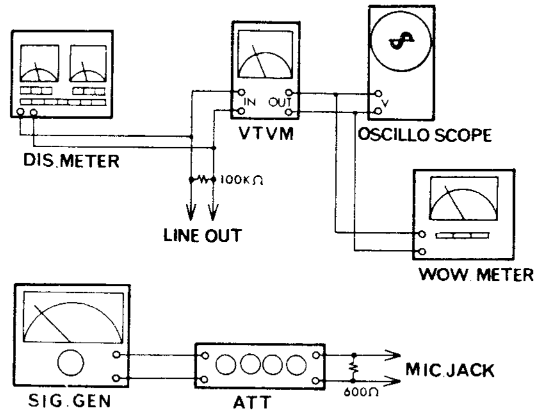
1) Remove Dolby NR circuit board from set and connect as shown in drawing.
2) Turn SFR301 (302) and SFR303 (304) fully in the directions shown by arrows.
3) Position switches as follows.
   REC/PB: PB
   GATE: OPEN
   DOLBY-NR: OFF
4) Apply 400Hz signal and adjust attenuator so that output becomes 7.6mV, then read attenuator value.
   Rating: −49dB ±1dB
5) Set REC/PB switch to REC and confirm output level difference of ±0.25dB. Next at frequencies of 100Hz, 1kHz and 10kHz, confirm an output level difference of ±1dB.
6) Position switches as follows.
   REC/PB: PB
   GATE: SHORT
   DOLBY-NR: OFF
7) Apply 5kHz signal and adjust attenuator so that output becomes 7.6mV, then read attenuator value.
   Rating: −49 ±1dB
   Next set DOLBY-NR switch to ON and adjust SFR303 (304) for 2.4mV output.
8) At the above (step 7) condition, set GATE switch to OPEN and adjust SFR301 (302) for 3mV output.
9) After adjusting, apply locking compound to trimmer resistors.

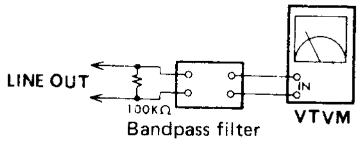
ELECTRICAL MEASUREMENTS

PREPARATIONS FOR MEASURING

1. **Required Equipment**
   - Low frequency oscillator
   - Variable resistance attenuator
   - Oscilloscope
   - 600Ω and 100kΩ resistors
   - Distortion meter
   - Wow meter
   - 1kHz bandpass filter
   - Test tapes: TTA-116/TTA-114/TTA-119D (CrO_2)/TTA-119E (Fe-Cr)/TTA-119A (LH)

2. **Connection**


IN
OUT
VTVM
OSCILLO SCOPE
DIS.METER
100KΩ
LINE OUT
WOW METER
SIG.GEN
ATT
600Ω
MIC JACK


LINE OUT
100KΩ
IN
VTVM

Bandpass filter

3. **Measuring Cautions**
   1) Before measuring, demagnetize rec/play and erase heads with head eraser and clean heads with gauze moistened in alcohol.
   2) Set playback volume to maximum.
   3) Standard inputs (0dB = 0.775V)
      MIC jack 65dB
      LINE-IN 20dB
   4) Connect 100kΩ load resistor to LINE OUT.

1. **Playback Output**
   Play test tape TTA-161 and measure output level.
   Rating: 1.03V ±0.5dB

2. **Recording/Playback Distortion**
   Apply 400Hz signal via MIC jack and adjust attenuator for OVU indication on set VU meter. Record this signal on test tape and measure playback distortion.
   Ratings:

Test Tape	TAPE SELECTOR	Distortion
TTA-119D (CrO_2 tape)	CrO_2	Less than 2.5%
TTA-119E (Fe-Cr tape)	Fe-Cr	Less than 1.0%
TTA-119A (LH tape)	LH-NORMAL	Less than 1.5%

3. **Recording/Playback Frequency Response**
Apply 1kHz signal via MIC jack and adjust attenuator for 75mV at LINE OUT. Read the input level. On test tape record 60Hz, 100Hz, 1kHz, 10kHz, and 15kHz signals in sequence and play back. With 1kHz level as reference, measure each frequency level deviation.

Ratings:

Frequency	**Test Tape TTA-119D TAPE SELECTOR CrO_2**	**Test Tape TTA-119E TAPE SELECTOR Fe-Cr**	**Test Tape TTA-119A TAPE SELECTOR LH-NORMAL**
60Hz	$^{+2}_{-3}$ dB	$^{+2}_{-3}$ dB	$^{+2}_{-3}$ dB
100Hz	±1 dB	±1 dB	±1 dB
1kHz	0 dB	0 dB	0 dB
10kHz	±1 dB	±1 dB	±1 dB
15kHz	$^{+1}_{-3}$ dB	$^{+1}_{-3}$ dB	–
12.5kHz	–	–	$^{+1}_{-3}$ dB

For LH-NORMAL, measure at 12.5kHz instead of 15kHz.

4. **Recording/Playback S/N**
Apply 400Hz signal via MIC jack and adjust attenuator for OVU indication on set VU meter. Short input and record with no signal. Play back and measure ratio between signal and no-signal portions.

Ratings:

TEST TAPE	TAPE SELECTOR	DOLBY-NR OFF S/N (dB)	DOLBY-NR ON S/N (dB)
TTA-119D (CrO_2)	CrO_2	−45	−49
TTA-119E (FeCr)	Fe-Cr	−40	−49
TTA-119A (LH)	LH-NORMAL	−43	−48

5. **Erase Efficiency**
TAPE SELECTOR: CrO_2
Apply 1kHz signal via MIC jack and adjust attenuator for OVU indication on set VU meter. On test tape TTA-119D, record signal decreased by +10dB of this attenuation value. Rewind half the recorded portion, set recording volume to minimum and erase. Play back tape and measure signal and erased portion levels. Measure playback level through a 1kHz bandpass filter.
Rating: −65dB

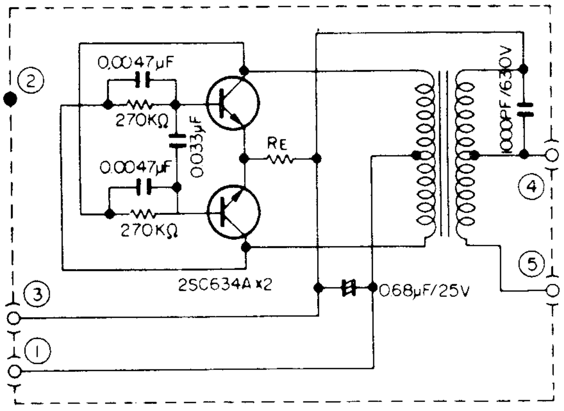
6. **Channel Separation**
TAPE SELECTOR: LH-NORMAL
Apply 1kHz signal via right channel MIC jack and adjust attenuator for OVU indication on set VU meter. Record and play back with TTA-119A test tape. Measure left channel leakage level with respect to the right channel output level. Measure playback level through 1kHz bandpass filter.
Rating: More than 30dB

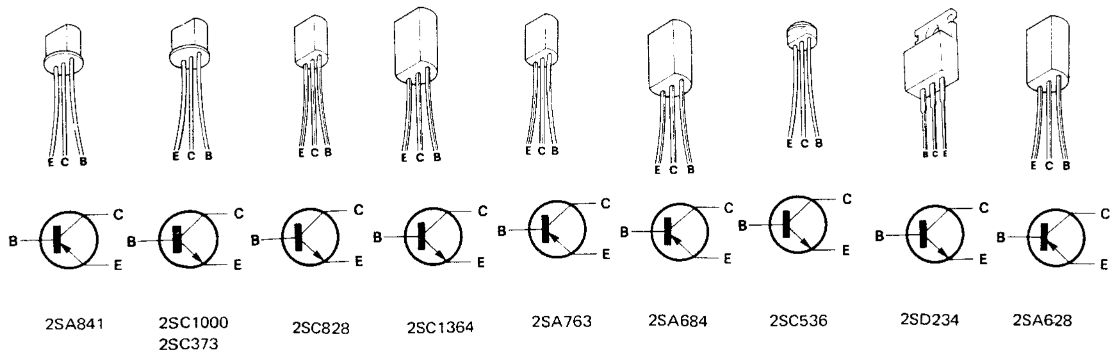
7. **Crosstalk**
TAPE SELECTOR: LH-NORMAL
Turn tape over and measure right channel leakage level with respect to right channel output level of signal recorded for channel separation measurement (step 6 above). Employ bandpass filter.
Rating: More than 60dB

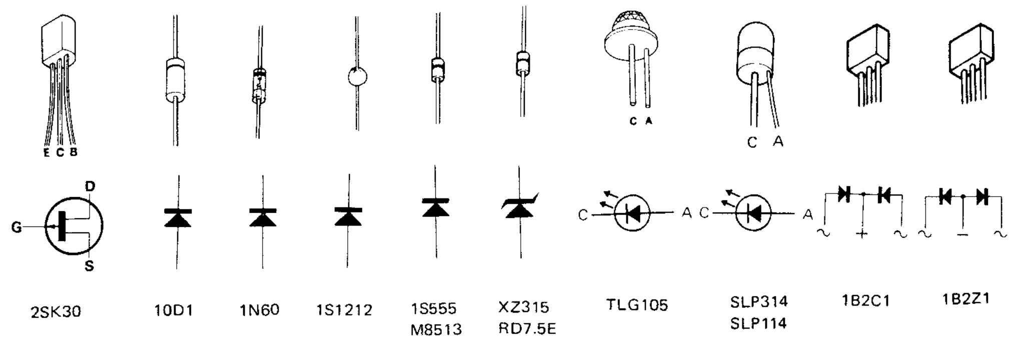
8. **Dolby NR Effectiveness**
TAPE SELECTOR: LH-NORMAL
Play test tape TTA-114 and measure DOLBY NR switch ON level difference with respect to DOLBY NR switch OFF level.
Rating: −4 ±1dB

9. **DNL Effectiveness**
Install test tape and set for playback mode, then set for pause. Measure noise level difference with DNL switch ON in respect to noise level with DNL switch OFF.
Rating: More than 3dB

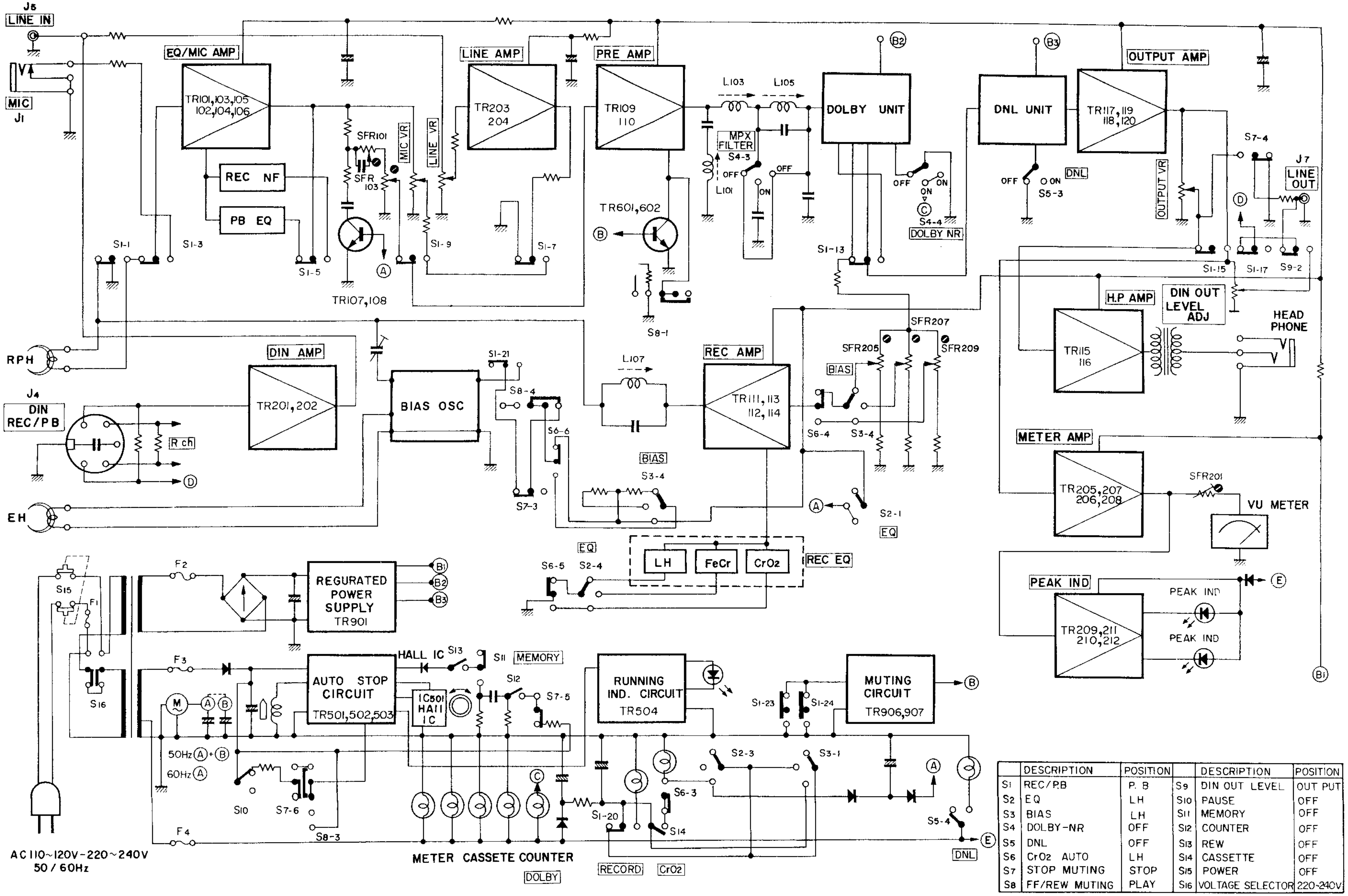
SCHEMATIC DIAGRAM–OSC UNIT


②
0.0047µF
270KΩ
0.033µF
0.0047µF
270KΩ
RE
2SC634A x2
1000PF/630V
④
⑤
③
0.68µF/25V
①


E C B
B C E
B
C
E
2SA841
2SC1000
2SC373
2SC828
2SC1364
2SA763
2SA684
2SC536
2SD234
2SA628

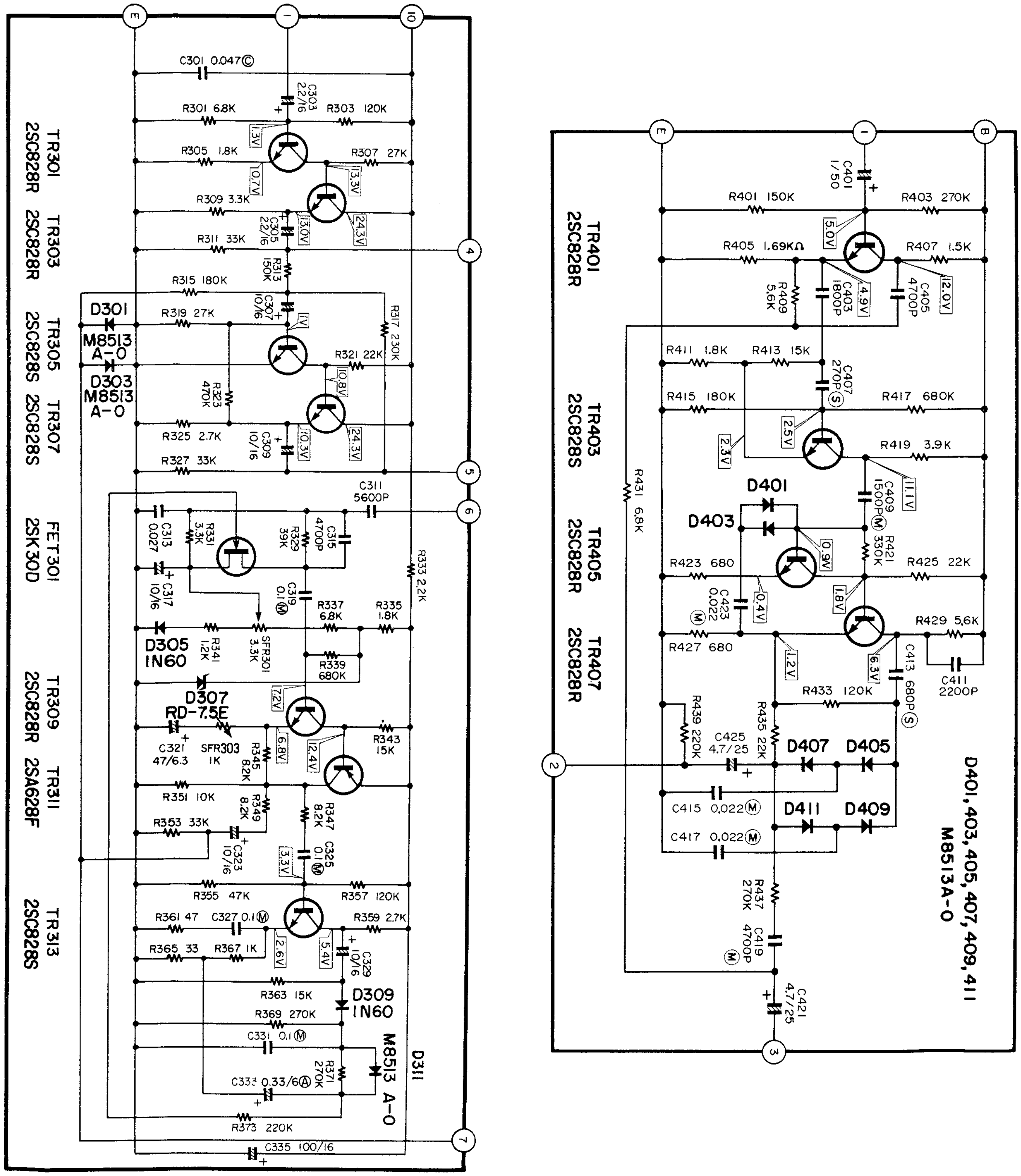

E C B
C A
D
G
S
C
A
+
−
~
2SK30
10D1
1N60
1S1212
1S555
M8513
XZ315
RD7.5E
TLG105
SLP314
SLP114
1B2C1
1B2Z1

BLOCK DIAGRAM

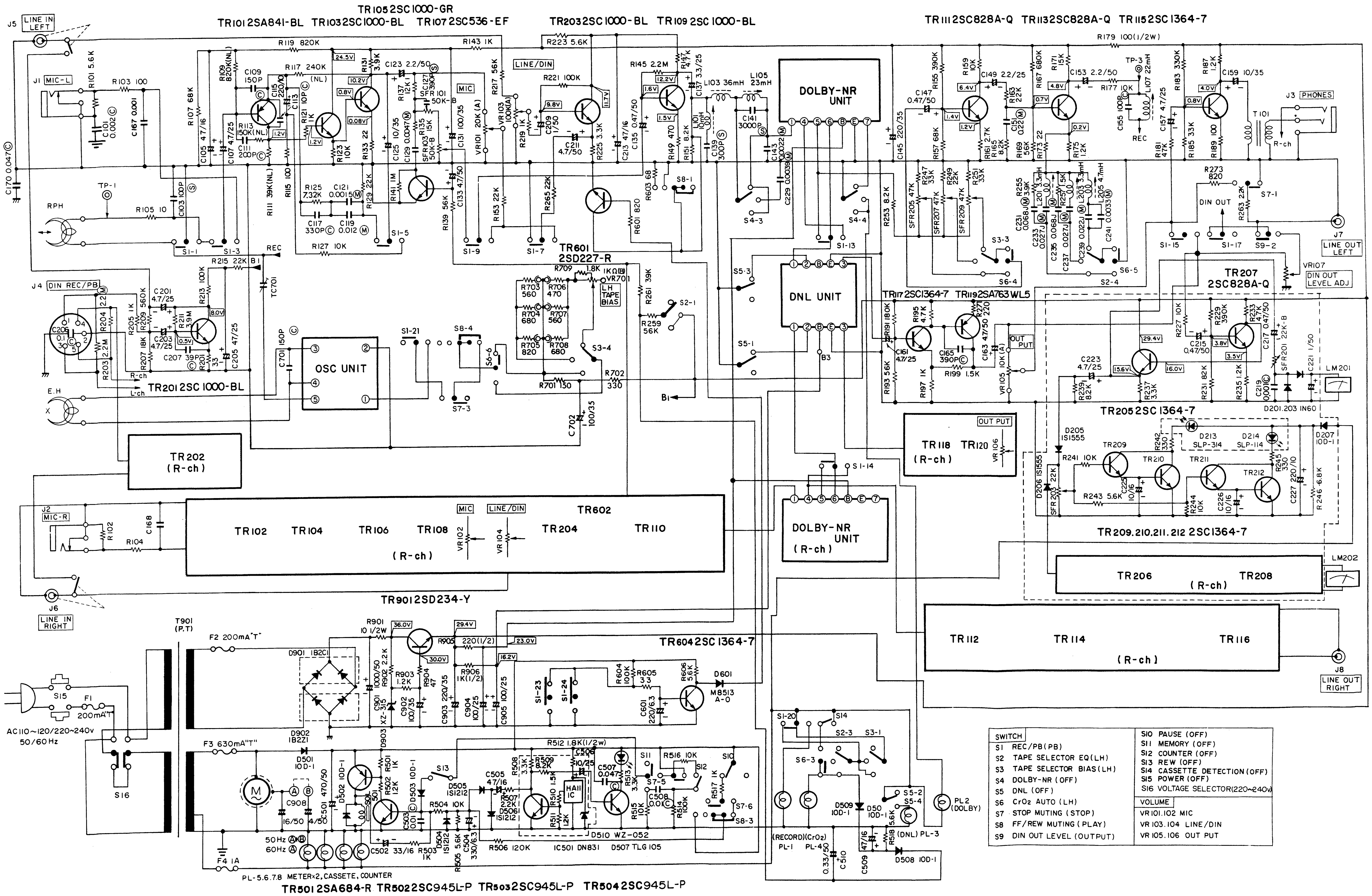

J5
LINE IN
MIC
J1
EQ/MIC AMP
TR101,103,105
102,104,106
REC NF
PB EQ
S1-1
S1-3
S1-5
SFR101
SFR 103
MIC VR
LINE VR
S1-9
TR107,108
A
LINE AMP
TR203
204
S1-7
PRE AMP
TR109
110
TR601,602
B
S8-1
L103
L105
MPX FILTER
S4-3
OFF
ON
L101
DOLBY UNIT
B2
OFF
ON
C
S4-4
DOLBY NR
S1-13
DNL UNIT
B3
OFF
O ON
DNL
S5-3
OUTPUT AMP
TR117,119
118,120
OUTPUT VR
S7-4
J7
LINE OUT
D
S1-15
S1-17
S9-2
RPH
J4
DIN
REC/PB
R ch
D
EH
DIN AMP
TR201,202
BIAS OSC
S1-21
S8-4
S6-6
S7-3
S3-4
BIAS
L107
REC AMP
TR111,113
112,114
S6-4
S3-4
BIAS
SFR205
SFR207
SFR209
A
S2-1
EQ
EQ
S6-5
S2-4
LH
FeCr
CrO2
REC EQ
H.P AMP
TR115
116
DIN OUT
LEVEL
ADJ
HEAD
PHONE
METER AMP
TR205,207
206,208
SFR201
VU METER
PEAK IND
TR209,211
210,212
PEAK IND
PEAK IND
E
B1
S15
F1
S16
F2
REGURATED
POWER
SUPPLY
TR901
B1
B2
B3
F3
M
A
B
50Hz A+B
60Hz A
AUTO STOP
CIRCUIT
TR501,502,503
HALL IC
S13
S11
MEMORY
IC501
HA11
IC
S12
S7-5
S10
S7-6
S8-3
F4
AC 110~120V~220~240V
50 / 60Hz
C
METER CASSETE COUNTER
DOLBY
RUNNING
IND. CIRCUIT
TR504
S1-20
S6-3
S14
RECORD
CrO2
S2-3
S3-1
S1-23
S1-24
MUTING
CIRCUIT
TR906,907
B
A
S5-4
E
DNL

	DESCRIPTION	POSITION		DESCRIPTION	POSITION
S1	REC/P.B	P. B	S9	DIN OUT LEVEL	OUT PUT
S2	EQ	LH	S10	PAUSE	OFF
S3	BIAS	LH	S11	MEMORY	OFF
S4	DOLBY-NR	OFF	S12	COUNTER	OFF
S5	DNL	OFF	S13	REW	OFF
S6	CrO2 AUTO	LH	S14	CASSETTE	OFF
S7	STOP MUTING	STOP	S15	POWER	OFF
S8	FF/REW MUTING	PLAY	S16	VOLTAGE SELECTOR	220~240V

SCHEMATIC DIAGRAM, DOLBY-NR/DNL


E
I
10
C301 0.047Ⓒ
C303 22/16
R301 6.8K
R303 120K
1.3V
R305 1.8K
R307 27K
13.3V
0.7V
R309 3.3K
C305 22/16
13.0V
24.3V
R311 33K
4
R313 150K
R315 180K
C307 10/16
R317 230K
D301 M8513 A-0
D303 M8513 A-0
R319 27K
1V
R321 22K
R323 470K
10.8V
R325 2.7K
C309 10/16
10.3V
24.3V
R327 33K
5
C311 5600P
6
C313 0.027
R331 3.3K
R329 39K
C315 4700P
R333 2.2K
C317 10/16
C319 0.1Ⓜ
D305 1N60
R341 1.2K
SFR301 3.3K
R337 6.8K
R335 1.8K
R339 680K
D307 RD-7.5E
7.2V
C321 47/6.3
SFR303 1K
R345 82K
6.8V
12.4V
R343 15K
R351 10K
R349 8.2K
R347 8.2K
R353 33K
C323 10/16
3.3V
C325 0.1Ⓜ
R355 47K
R357 120K
R361 47
C327 0.1Ⓜ
R359 2.7K
R365 33
R367 1K
2.6V
5.4V
C329 10/16
R363 15K
D309 1N60
R369 270K
C331 0.1Ⓜ
D311 M8513 A-0
R371 270K
C333 0.33/6Ⓐ
R373 220K
7
C335 100/16
TR301 2SC828R TR303 2SC828R
TR305 2SC828S TR307 2SC828S
FET301 2SK30D
TR309 2SC828R TR311 2SA628F
TR313 2SC828S
E
I
B
C401 1/50
R401 150K
R403 270K
5.0V
R405 1.69KΩ
R407 1.5K
R409 5.6K
C403 1800P
4.9V
C405 4700P
12.0V
TR401 2SC828R
R411 1.8K
R413 15K
C407 270PⓈ
R415 180K
R417 680K
2.5V
2.3V
R419 3.9K
R431 6.8K
TR403 2SC828S
D401
D403
C409 1500PⓂ
11.1V
R421 330K
0.9V
R423 680
R425 22K
TR405 2SC828R
C423 0.022Ⓜ
0.4V
1.8V
R429 5.6K
R427 680
TR407 2SC828R
1.2V
6.3V
C413 680PⓈ
C411 2200P
R433 120K
R439 220K
R435 22K
C425 4.7/25
D407
D405
2
C415 0.022Ⓜ
D411
D409
C417 0.022Ⓜ
D401,403,405,407,409,411 M8513A-0
R437 270K
C419 4700PⓂ
C421 4.7/25
3

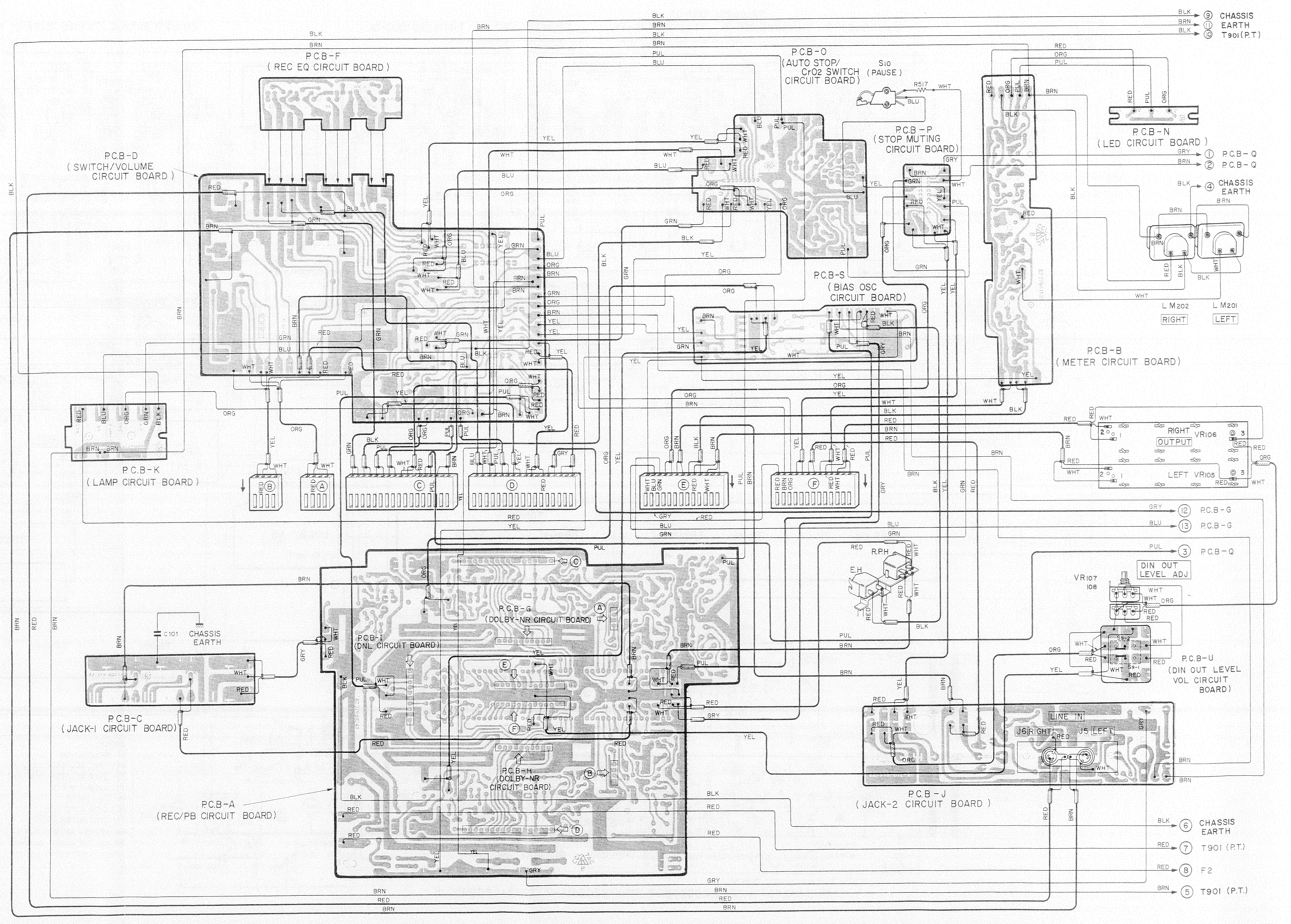
SCHEMATIC DIAGRAM


TR105 2SC1000-GR
TR101 2SA841-BL TR103 2SC1000-BL TR107 2SC536-EF
TR203 2SC1000-BL TR109 2SC1000-BL
TR111 2SC828A-Q TR113 2SC828A-Q TR115 2SC1364-7
J5 LINE IN LEFT
J1 MIC-L
J4 DIN REC/PB
J2 MIC-R
J6 LINE IN RIGHT
J3 PHONES
J7 LINE OUT LEFT
J8 LINE OUT RIGHT
RPH
E.H
TP-1
TP-3
LINE/DIN
MIC
DOLBY-NR UNIT
DNL UNIT
OSC UNIT
DOLBY-NR UNIT (R-ch)
TR601 2SD227-R
LH TAPE BIAS
TR201 2SC1000-BL
TR202 (R-ch)
TR102 TR104 TR106 TR108 TR204 TR110 (R-ch)
TR602
TR117 2SC1364-7 TR119 2SA763WL5
TR118 TR120 (R-ch)
OUT PUT
TR207 2SC828A-Q
VR107 DIN OUT LEVEL ADJ
TR205 2SC1364-7
TR209 TR210 TR211 TR212
TR209.210.211.212 2SC1364-7
D213 SLP-314 D214 SLP-114
D201.203 IN60
LM201
LM202
TR206 TR208 (R-ch)
TR112 TR114 TR116 (R-ch)
TR901 2SD234-Y
T901 (P.T)
F2 200mA"T"
F1 200mA"T"
F3 630mA"T"
F4 1A
S15
S16
AC110~120/220~240v 50/60Hz
D901 1B2C1
D902 1B2Z1
TR604 2SC1364-7
D601 M8513 A-0
HA11 IC
D510 WZ-052
IC501 DN831 D507 TLG105
50Hz Ⓐ Ⓑ
60Hz Ⓐ
PL-5.6.7.8 METER×2, CASSETE, COUNTER
TR501 2SA684-R TR502 2SC945L-P TR503 2SC945L-P TR504 2SC945L-P
(RECORD) (CrO2)
PL-1 PL-4
PL2 (DOLBY)
(DNL) PL-3

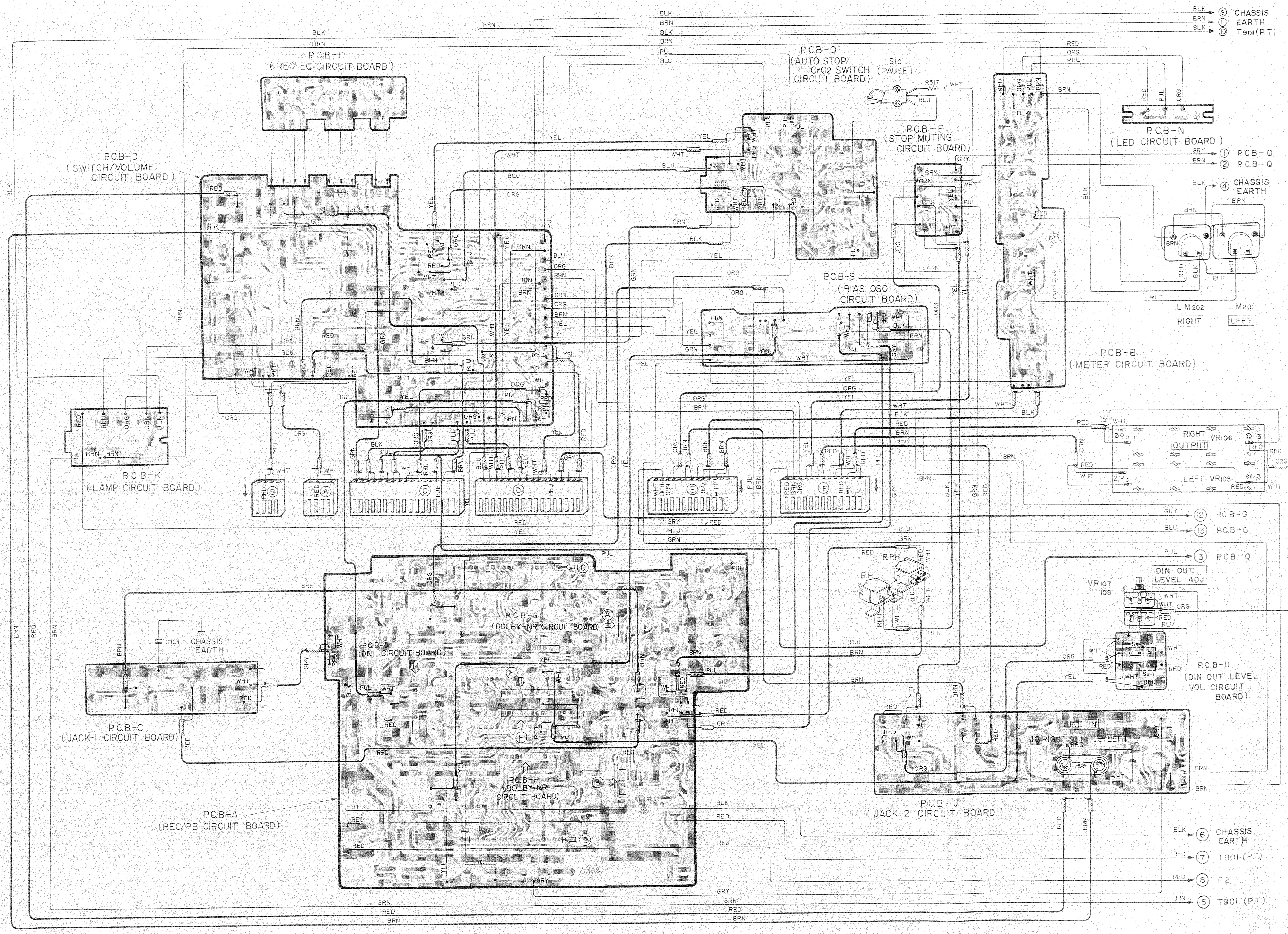
SWITCH	
S1	REC/PB(PB)
S2	TAPE SELECTOR EQ(LH)
S3	TAPE SELECTOR BIAS(LH)
S4	DOLBY-NR (OFF)
S5	DNL (OFF)
S6	CrO2 AUTO (LH)
S7	STOP MUTING (STOP)
S8	FF/REW MUTING (PLAY)
S9	DIN OUT LEVEL (OUTPUT)
S10	PAUSE (OFF)
S11	MEMORY (OFF)
S12	COUNTER (OFF)
S13	REW (OFF)
S14	CASSETTE DETECTION (OFF)
S15	POWER (OFF)
S16	VOLTAGE SELECTOR(220~240v)

VOLUME	
VR101.102	MIC
VR103.104	LINE/DIN
VR105.106	OUT PUT

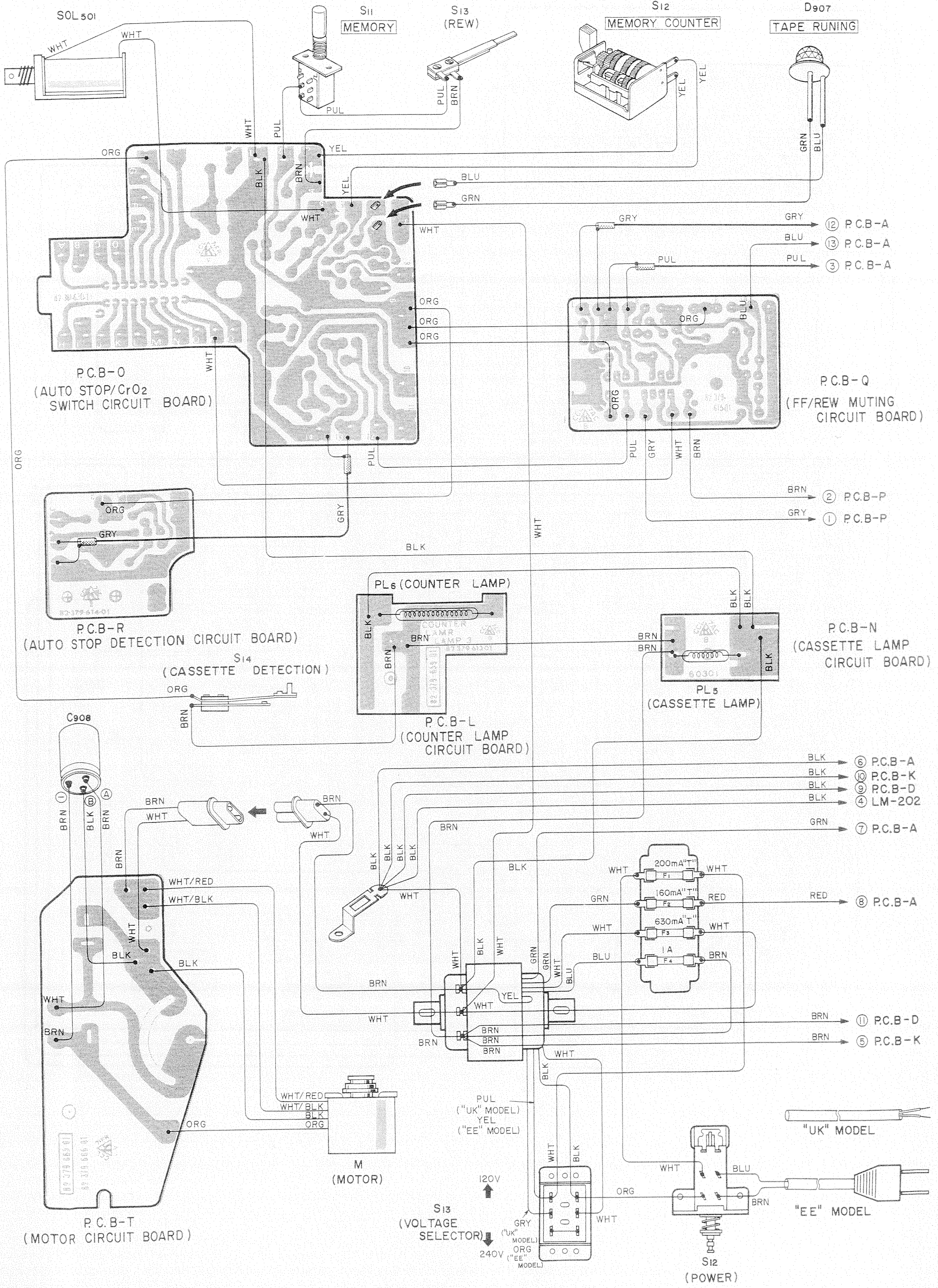
WIRING


P.C.B-F
(REC EQ CIRCUIT BOARD)
P.C.B-D
(SWITCH/VOLUME CIRCUIT BOARD)
P.C.B-O
(AUTO STOP/ CrO2 SWITCH CIRCUIT BOARD)
S10 (PAUSE)
R517
P.C.B-P
(STOP MUTING CIRCUIT BOARD)
P.C.B-N
(LED CIRCUIT BOARD)
P.C.B-S
(BIAS OSC CIRCUIT BOARD)
P.C.B-B
(METER CIRCUIT BOARD)
L M202 RIGHT
L M201 LEFT
P.C.B-K
(LAMP CIRCUIT BOARD)
⑨ CHASSIS
⑪ EARTH
⑩ T901(P.T)
① P.C.B-Q
② P.C.B-Q
④ CHASSIS EARTH
RIGHT OUTPUT VR106
LEFT VR105
⑫ P.C.B-G
⑬ P.C.B-G
③ P.C.B-Q
DIN OUT LEVEL ADJ
VR107 108
P.C.B-U
(DIN OUT LEVEL VOL CIRCUIT BOARD)
R.P.H
E.H
C101
CHASSIS EARTH
P.C.B-C
(JACK-1 CIRCUIT BOARD)
P.C.B-G
(DOLBY-NR CIRCUIT BOARD)
P.C.B-I
(DNL CIRCUIT BOARD)
P.C.B-H
(DOLBY-NR CIRCUIT BOARD)
P.C.B-A
(REC/PB CIRCUIT BOARD)
LINE IN
J6 RIGHT
J5 LEFT
P.C.B-J
(JACK-2 CIRCUIT BOARD)
⑥ CHASSIS EARTH
⑦ T901 (P.T.)
⑧ F2
⑤ T901 (P.T.)
Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ Ⓕ
BLK BRN RED ORG YEL GRN BLU PUL GRY WHT

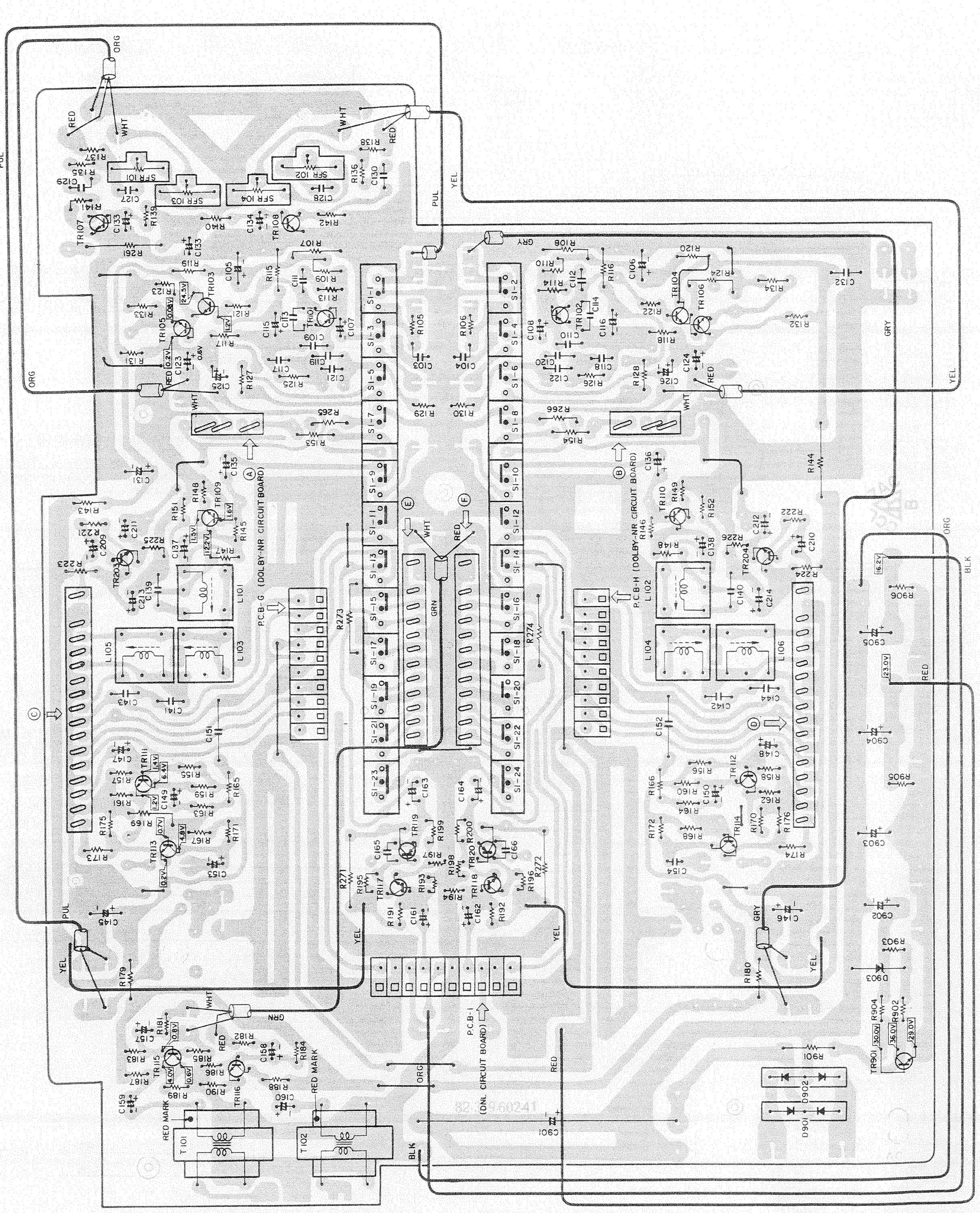
WIRING


P.C.B-F
(REC EQ CIRCUIT BOARD)
P.C.B-D
(SWITCH/VOLUME
CIRCUIT BOARD)
P.C.B-O
(AUTO STOP/
CrO2 SWITCH
CIRCUIT BOARD)
S10
(PAUSE)
R517
P.C.B-P
(STOP MUTING
CIRCUIT BOARD)
P.C.B-N
(LED CIRCUIT BOARD)
⑨ CHASSIS
⑪ EARTH
⑩ T901(P.T.)
① P.C.B-Q
② P.C.B-Q
④ CHASSIS
EARTH
LM202
RIGHT
LM201
LEFT
P.C.B-S
(BIAS OSC
CIRCUIT BOARD)
P.C.B-B
(METER CIRCUIT BOARD)
P.C.B-K
(LAMP CIRCUIT BOARD)
RIGHT VR106
OUTPUT
LEFT VR105
⑫ P.C.B-G
⑬ P.C.B-G
③ P.C.B-Q
DIN OUT
LEVEL ADJ
VR107
108
R.P.H
E.H
C101
CHASSIS
EARTH
P.C.B-C
(JACK-1 CIRCUIT BOARD)
P.C.B-G
(DOLBY-NR CIRCUIT BOARD)
P.C.B-I
(DNL CIRCUIT BOARD)
P.C.B-H
(DOLBY-NR
CIRCUIT BOARD)
P.C.B-A
(REC/PB CIRCUIT BOARD)
P.C.B-U
(DIN OUT LEVEL
VOL CIRCUIT
BOARD)
S9-2
S9-1
LINE IN
J6 RIGHT
J5 LEFT
P.C.B-J
(JACK-2 CIRCUIT BOARD)
⑥ CHASSIS
EARTH
⑦ T901 (P.T.)
⑧ F2
⑤ T901 (P.T.)
A
B
C
D
E
F
BLK
BRN
RED
ORG
YEL
GRN
BLU
PUL
GRY
WHT

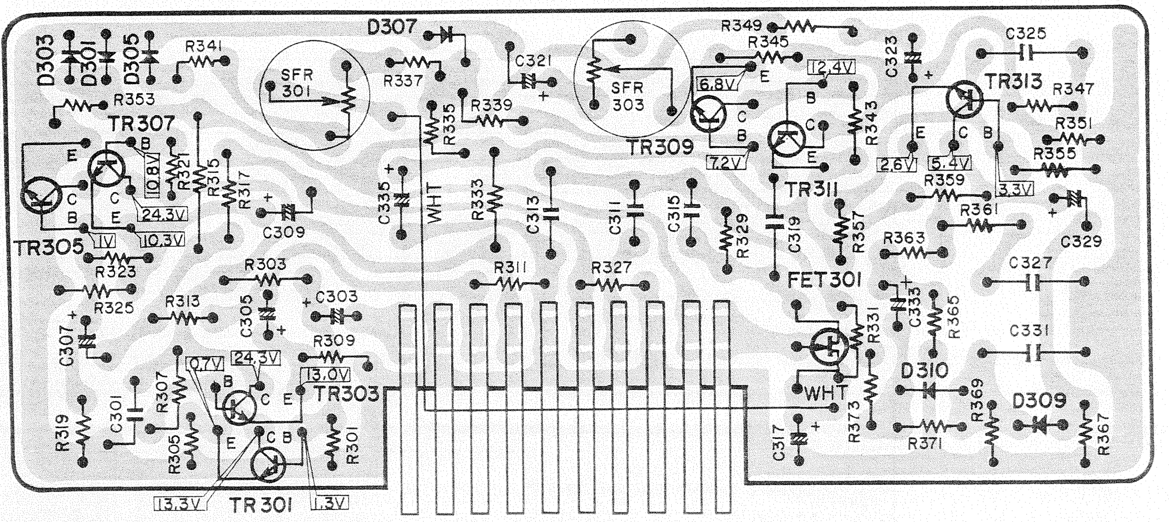
WIRING


SOL501
S11 MEMORY
S13 (REW)
S12 MEMORY COUNTER
D907 TAPE RUNING
WHT
PUL
BRN
YEL
GRN
BLU
ORG
BLK
GRY
RED
⑫ P.C.B-A
⑬ P.C.B-A
③ P.C.B-A
P.C.B-O
(AUTO STOP/CrO2 SWITCH CIRCUIT BOARD)
P.C.B-Q
(FF/REW MUTING CIRCUIT BOARD)
② P.C.B-P
① P.C.B-P
P.C.B-R
(AUTO STOP DETECTION CIRCUIT BOARD)
S14
(CASSETTE DETECTION)
PL6 (COUNTER LAMP)
P.C.B-L
(COUNTER LAMP CIRCUIT BOARD)
P.C.B-N
(CASSETTE LAMP CIRCUIT BOARD)
PL5
(CASSETTE LAMP)
C908
⑥ P.C.B-A
⑩ P.C.B-K
⑨ P.C.B-D
④ LM-202
⑦ P.C.B-A
200mA "T" F1
160mA "T" F2
630mA "T" F3
1A F4
⑧ P.C.B-A
⑪ P.C.B-D
⑤ P.C.B-K
WHT/RED
WHT/BLK
M
(MOTOR)
P.C.B-T
(MOTOR CIRCUIT BOARD)
PUL ("UK" MODEL)
YEL ("EE" MODEL)
120V
240V
S13
(VOLTAGE SELECTOR)
GRY ("UK" MODEL)
ORG ("EE" MODEL)
S12
(POWER)
"UK" MODEL
"EE" MODEL

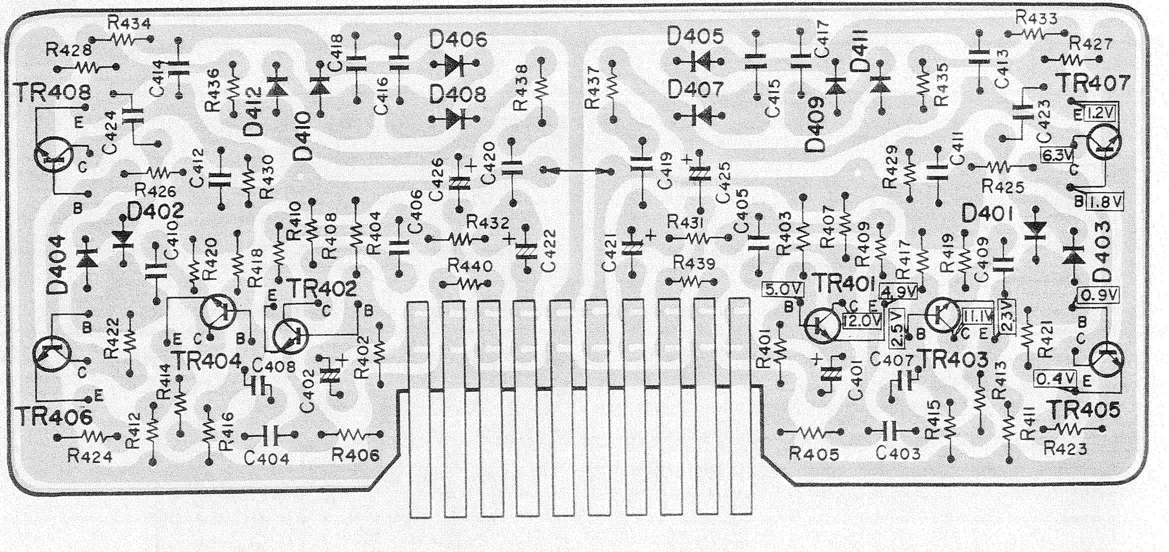
REC/PB CIRCUIT BOARD


P.C.B-G (DOLBY-NR CIRCUIT BOARD)
P.C.B-H (DOLBY-NR CIRCUIT BOARD)
P.C.B-I (DNL CIRCUIT BOARD)
SFR 101
SFR 102
SFR 103
SFR 104
L 101
L 102
L 103
L 104
L 105
L 106
T 101
T 102
RED MARK
ORG
RED
WHT
PUL
YEL
GRY
GRN
BLK

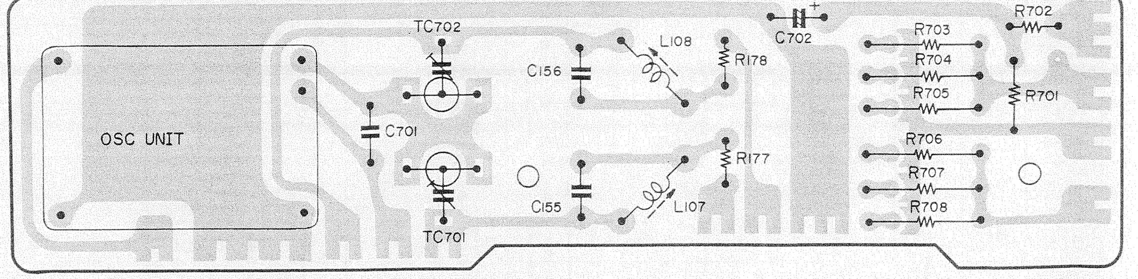
DOLBY-NR CIRCUIT BOARD


D303
D301
D305
R341
D307
R349
R345
C323
C325
SFR 301
R337
C321
SFR 303
12.4V
6.8V
TR313
R347
R353
R339
R335
TR309
R343
R351
TR307
10.8V
R321
R315
R317
7.2V
2.6V
5.4V
R355
3.3V
R359
24.3V
C335
WHT
R333
C313
C311
C315
R329
TR311
C319
R357
R361
C329
TR305
1V
10.3V
C309
R363
R323
R303
R311
R327
FET301
C327
R325
R313
C305
C303
C333
R365
C307
R309
R331
C331
0.7V
24.3V
13.0V
TR303
D310
R319
C301
R307
WHT
R373
R369
D309
R305
R301
C317
R371
R367
13.3V
TR301
1.3V

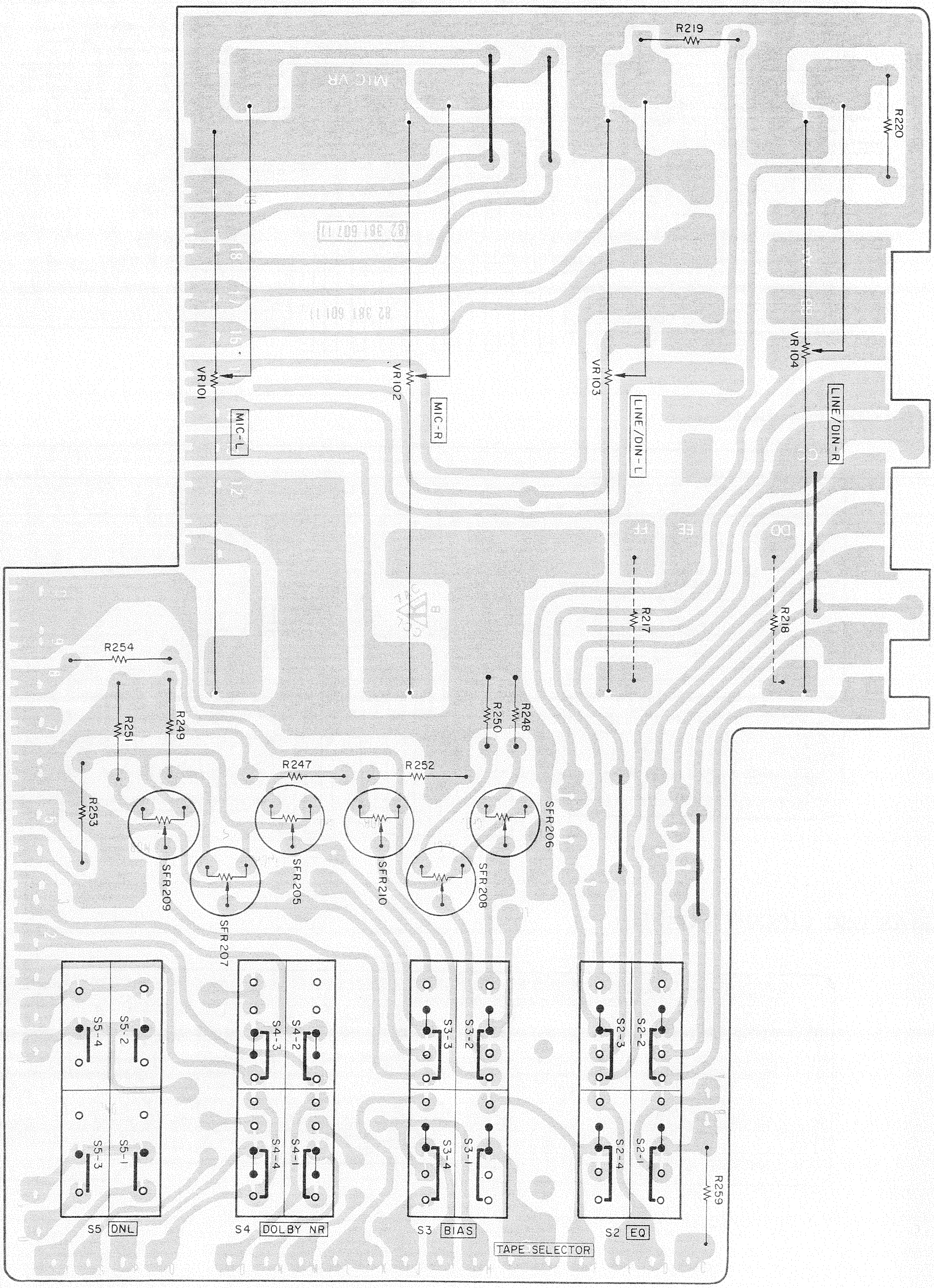
DNL CIRCUIT BOARD


R434
R428
C414
C418
D406
D405
C417
D411
R433
R427
TR408
R436
D412
D410
C416
D408
R438
R437
D407
C415
D409
R435
C413
TR407
C424
C423
1.2V
6.3V
R426
C412
R430
C426
C420
C419
C425
R429
C411
R425
1.8V
D402
R410
R408
R404
C406
R432
R431
C405
R403
R407
R409
D401
D404
C410
R420
R418
R440
C422
C421
R439
R417
R419
C409
D403
TR402
5.0V
TR401
4.9V
0.9V
12.0V
2.5V
11.1V
23V
R422
TR404
C408
R402
R401
C401
C407
TR403
R421
C402
R413
0.4V
TR406
R414
R412
R416
C404
R406
R405
C403
R415
R411
TR405
R424
R423

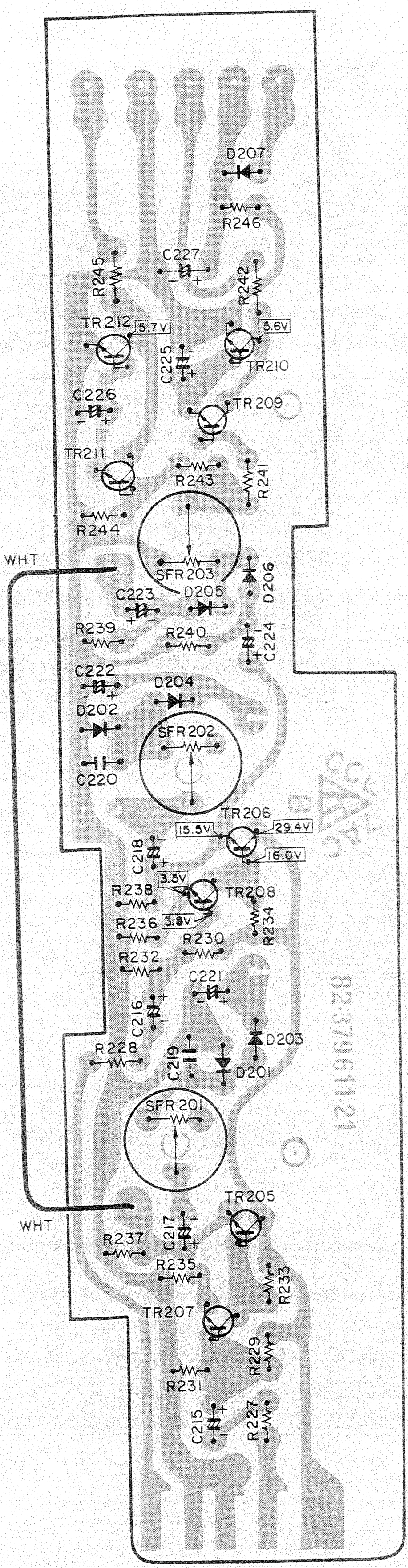
BIAS OSC CIRCUIT BOARD


C702
R702
TC702
L108
R703
R178
C156
R704
R705
R701
OSC UNIT
C701
R706
R177
R707
C155
L107
R708
TC701

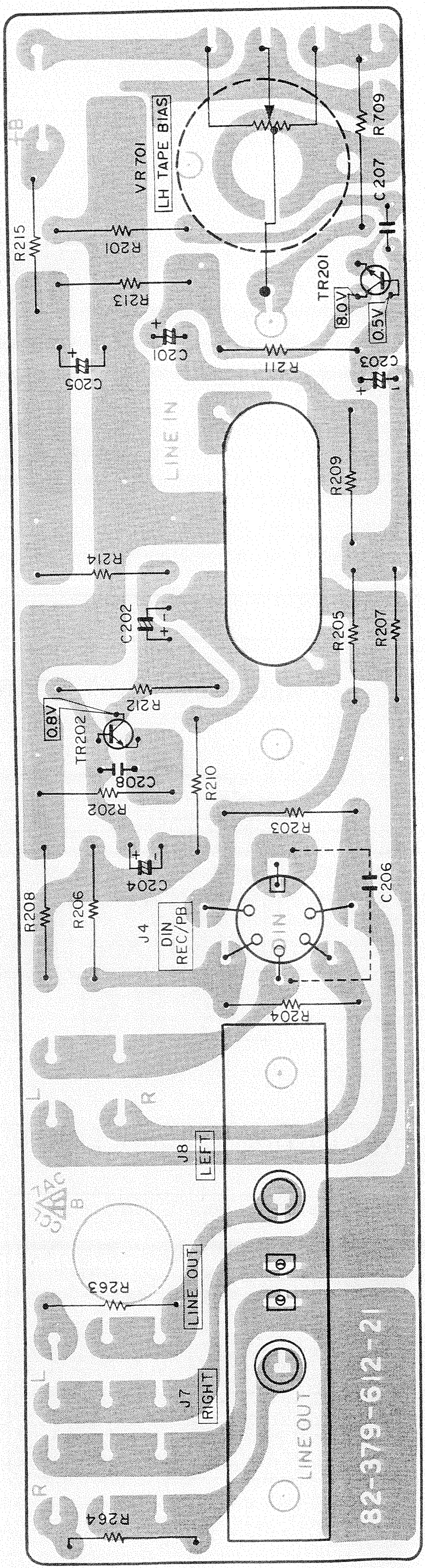
SWITCH/VOLUME CIRCUIT BOARD


R219
R220
VR101
VR102
VR103
VR104
MIC-L
MIC-R
LINE/DIN-L
LINE/DIN-R
R217
R218
R254
R251
R249
R253
R250
R248
R247
R252
SFR209
SFR207
SFR205
SFR210
SFR208
SFR206
S5-4
S5-2
S5-3
S5-1
S4-3
S4-2
S4-4
S4-1
S3-3
S3-2
S3-4
S3-1
S2-3
S2-2
S2-4
S2-1
R259
S5 DNL
S4 DOLBY NR
S3 BIAS
S2 EQ
TAPE SELECTOR

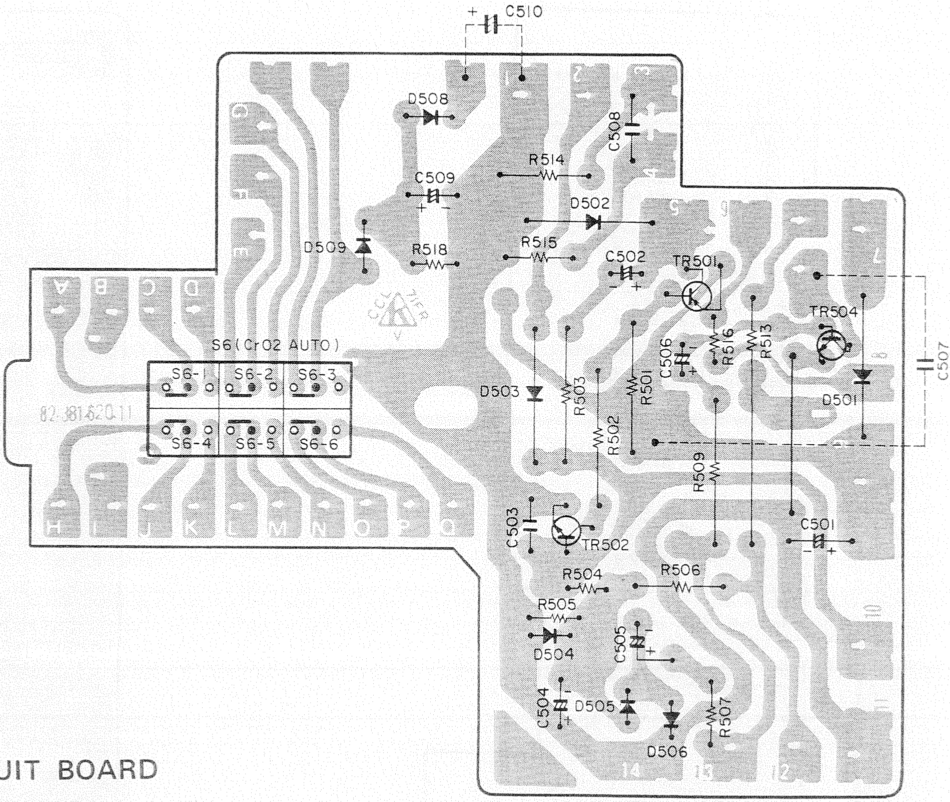
METER CIRCUIT BOARD


D207
R246
R245
C227
R242
TR212
5.7V
5.6V
C225
TR210
C226
TR209
TR211
R243
R241
R244
WHT
SFR203
D206
C223
D205
R239
R240
C224
C222
D204
D202
SFR202
C220
TR206
15.5V
29.4V
16.0V
C218
3.5V
R238
TR208
R236
3.8V
R230
R234
R232
C221
C216
D203
R228
C219
D201
SFR201
82-379611-21
WHT
TR205
R237
C217
R235
R233
TR207
R229
R231
C215
R227

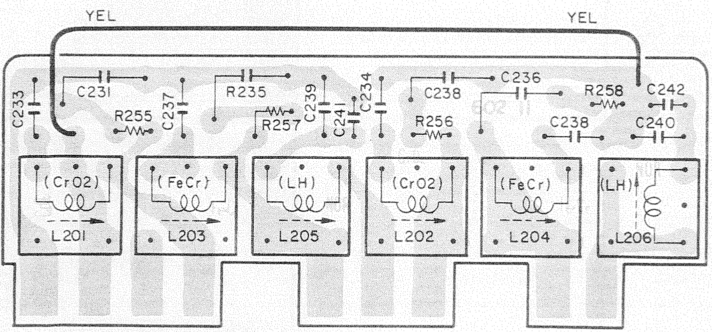
JACK-2 CIRCUIT BOARD


+B
VR701
LH TAPE BIAS
R709
C207
R215
R201
TR201
R213
8.0V
0.5V
C201
R211
C205
C203
LINE IN
R209
R214
C202
R205
R207
R212
0.8V
TR202
C208
R210
R202
R203
R208
R206
C204
C206
J4
DIN REC/PB
DIN
R204
L
R
J8
LEFT
R263
LINE OUT
L
J7
RIGHT
LINE OUT
R
82-379-612-21
R264

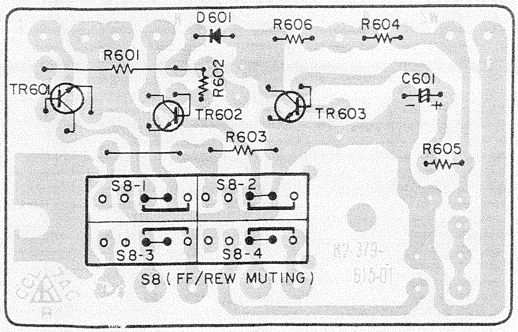
AUTO-STOP/CrO$_2$ SWITCH CIRCUIT BOARD


C510
D508
C508
R514
C509
D502
D509
R518
R515
C502
TR501
TR504
C507
S6 (CrO2 AUTO)
S6-1
S6-2
S6-3
S6-4
S6-5
S6-6
C506
R516
R513
D501
D503
R503
R501
R502
R509
82-J81-620-11
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
1
2
3
4
5
6
7
8
9
10
11
12
13
14
C503
TR502
C501
R504
R506
R505
D504
C505
C504
D505
D506
R507

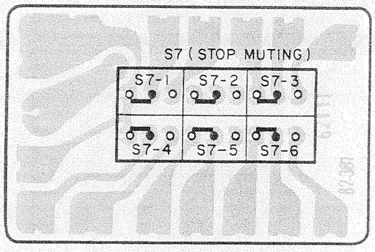
REC EQ CIRCUIT BOARD


YEL
YEL
C233
C231
R255
C237
R235
R257
C239
C241
C234
C238
C236
R256
R258
C242
C238
C240
(CrO2)
L201
(FeCr)
L203
(LH)
L205
(CrO2)
L202
(FeCr)
L204
(LH)
L206

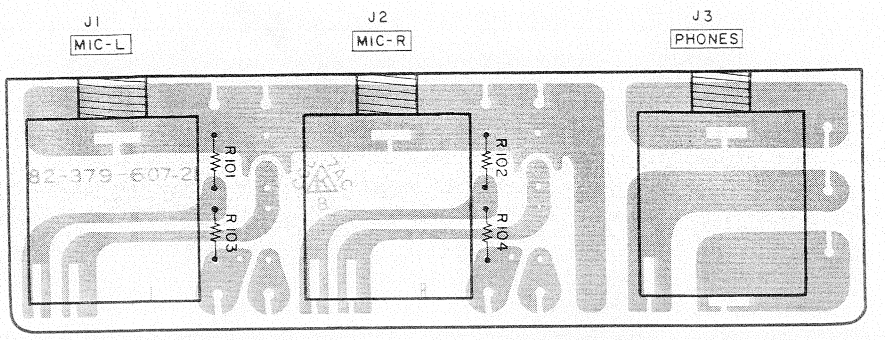
FF/REW MUTING CIRCUIT BOARD


D601
R606
R604
R601
R602
TR601
TR602
TR603
C601
R603
R605
S8-1
S8-2
S8-3
S8-4
S8 (FF/REW MUTING)
82-379-615-01

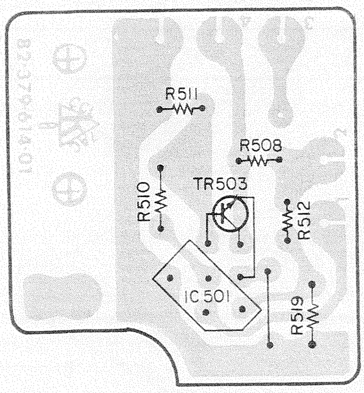
STOP MUTING CIRCUIT BOARD


S7 (STOP MUTING)
S7-1
S7-2
S7-3
S7-4
S7-5
S7-6
82-381

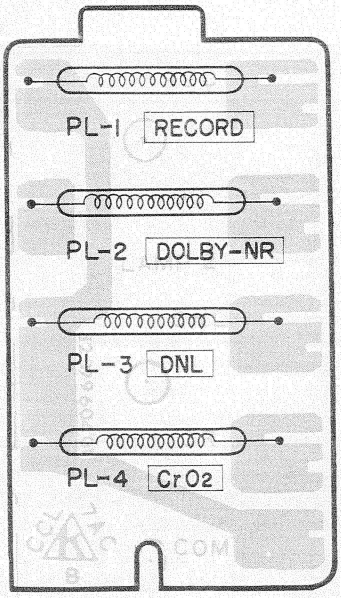
JACK-1 CIRCUIT BOARD


J1
MIC-L
J2
MIC-R
J3
PHONES
R101
R103
R102
R104
82-379-607-2

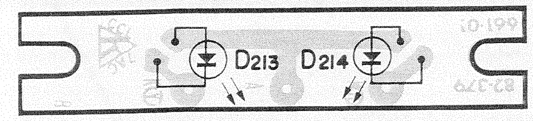
AUTO-STOP DETECTION CIRCUIT BOARD


R511
R508
R510
TR503
R512
IC501
R519

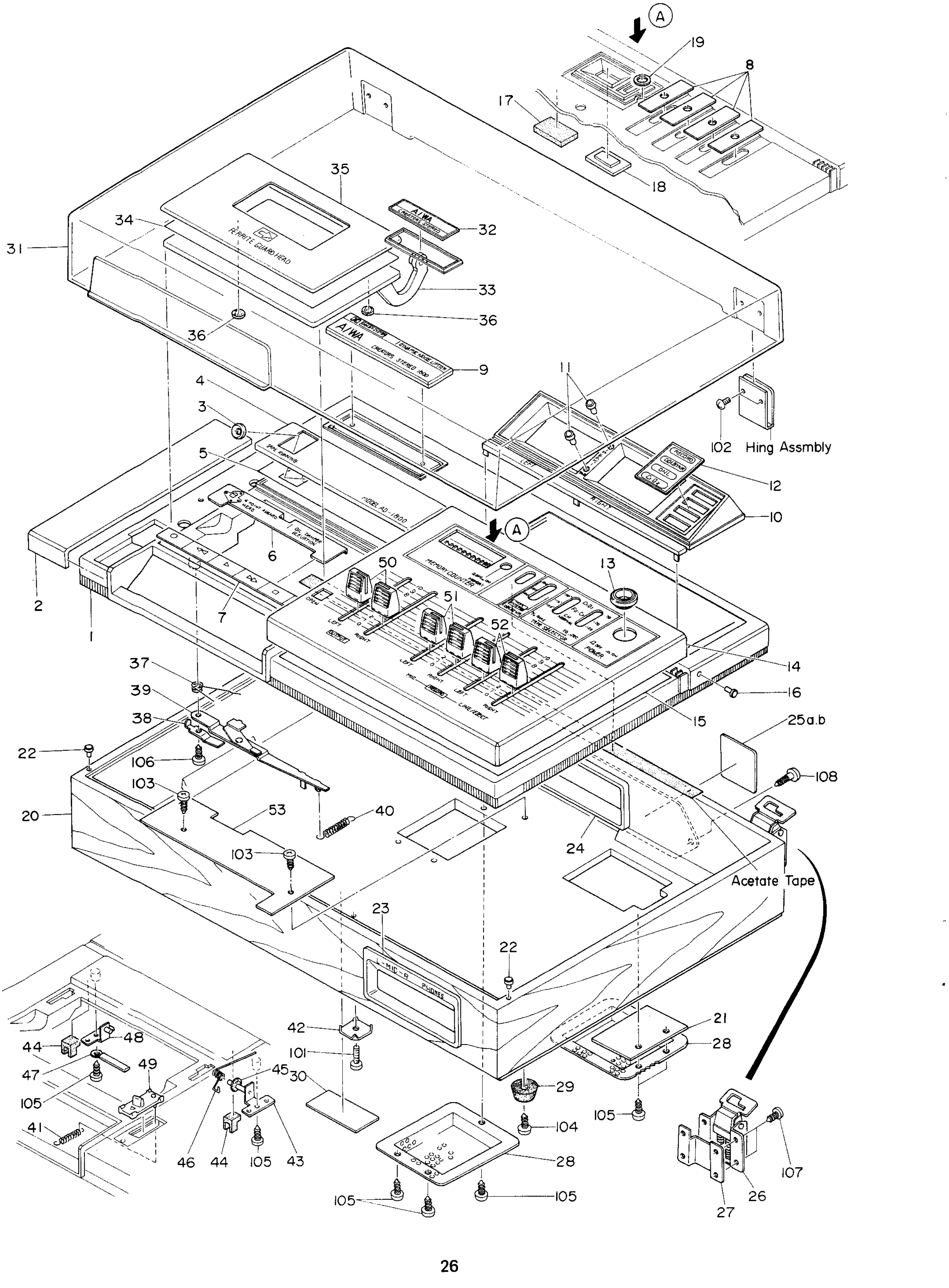
LAMP CIRCUIT BOARD


PL-1
RECORD
PL-2
DOLBY-NR
PL-3
DNL
PL-4
CrO2
COM

LED CIRCUIT BOARD



EXPLODED VIEW-1


A
19
8
17
18
35
32
34
31
33
36
36
9
11
4
3
102
Hing Assmbly
5
12
10
A
6
50
13
2
7
51
52
1
14
37
16
39
15
38
25a.b
22
106
108
103
20
53
40
24
103
Acetate Tape
23
22
21
42
28
44
48
47
49
45
101
30
29
105
105
104
41
46
44
105
43
28
107
105
105
26
27
FERRITE GUARD HEAD
MEMORY COUNTER
MODEL AD-1800
MIC-R PHONES
POWER
TAPE SELECTOR
LEFT
RIGHT
LINE/EFFECT

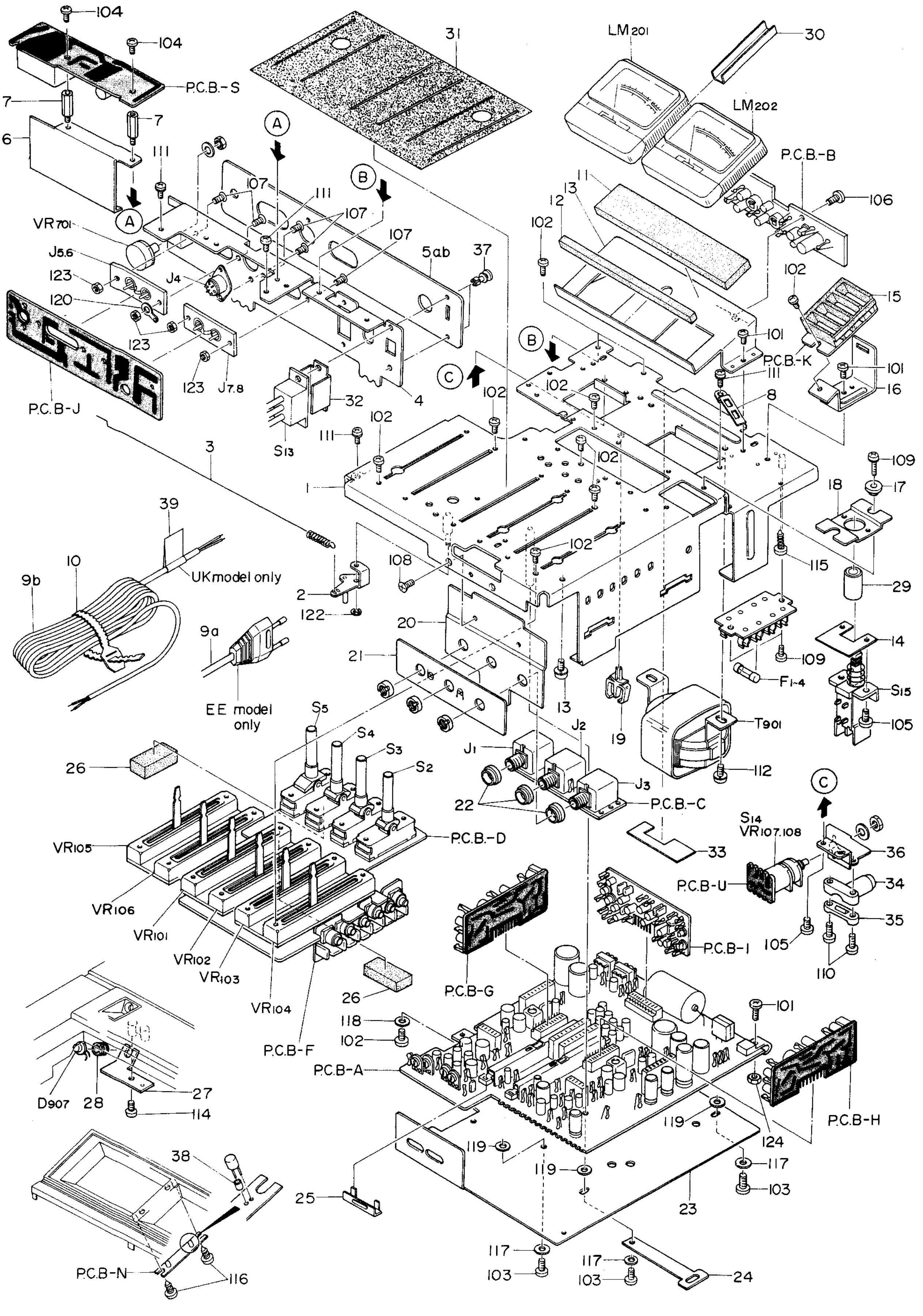
PARTS LIST

MECHANICAL PARTS

- * mark in this part list shows exclusive part (which is used) for only Model AD-1800

Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
1~30	80-003-790-41		Cabinet Assembly-"EE" model only (Main case ass'y + Bottom cover ass'y)		
1~30	80-003-790-01		Cabinet Assembly-"UK" model only (Main case ass'y + Bottom cover ass'y)		
1~20	**80-003-791-41**		**Main case ass'y (EE model only)**		
1~20	**80-003-791-01**		**Main case ass'y (UK model only)**		
1-1	82-379-007-01		Case proper	*	1
1-2	82-379-002-01		Panel B, Case proper	*	1
1-3	82-372-054-01		Decorative ring, Tape runing	AD-1500	1
1-4	82-379-060-01		Panel D, Case proper	*	1
1-5	82-372-407-01		Adhesive paper, Panel D	AD-1500	1
1-6	82-379-046-01		Head cover	*	1
1-7	82-379-049-01		Panel C, Case proper	*	1
1-8	82-372-047-01		Switch cover	AD-1500	4
1-9	82-379-074-01		Badge, AIWA	*	1
1-10	82-379-005-01		Panel, Meter	*	1
1-11	82-379-013-01		Decorative ring, Peak running	*	2
1-12	82-379-042-01		Indication plate	*	1
1-13	82-372-018-01		Decorative ring, Power switch	AD-1500	1
1-14	82-379-055-01		Panel AEE, Case proper	*	1
1-15	82-372-406-01		Adhesive paper, Panel A	AD-1500	1
1-16	87-085-090-01		Nylon rivet		2
1-17	82-381-219-01		M cushion C		1
1-18	82-072-048-01		Window, Tape counter		1
1-19	82-381-012-01		Switch cover B		1
1-20	82-379-062-01		Bottom cover	*	1
21~30	**80-003-792-41**		**Bottom cover ass'y (EE model only)**		
21~30	**80-003-792-01**		**Bottom cover ass'y (UK model only)**		
1-21	82-379-703-01		Insulation fiber C	*	1
1-22	82-372-413-01		Nylon pin	AD-1500	2
1-23	82-379-039-01		Decorative window, Front jack	*	1
1-24	82-372-012-01		Decorative window, Rear jack	AD-1500	1
1-25	82-379-065-01		Name plate, Spec.	*	1
1-26	82-372-429-01		Hinge ass'y	AD-1500	2
1-27	82-372-069-01		Hinge base	AD-1500	2
1-28	82-381-010-01		Cover, Transformer		2
1-29	87-085-061-01		Rubber foot		4
1-30	87-057-479-01		Label, Dolby		1
31~32	**80-003-795-41**		**Upper cover ass'y (EE model only)**		
31~32	**80-003-795-01**		**Upper cover ass'y (UK model only)**		
1-31	82-379-047-01		Dust cover	*	1
1-32	82-379-048-01		Name plate, Dust cover	*	1
33~36	**80-003-797-41**		**Cassette lid ass'y (EE model only)**		
33~36	**80-003-797-01**		**Cassette lid ass'y (UK model only)**		
1-33	82-372-007-01		Cassette lid	AD-1500	1
1-34	82-372-032-01		Adhesive paper, Cassette lid	AD-1500	1
1-35	82-379-012-01		Name plate, Cassette lid	*	1
1-36	82-372-058-01		Felt 7ϕ	AD-1500	2
1-37	82-379-257-01		Spring, Lid lock lever C	*	1
1-38	82-381-229-01		Plate spring, Lid lock lever		1
1-39	82-379-254-01		Lid lock lever B ass'y	*	1
1-40	82-379-285-01		Spring, Lid lock lever	*	1
1-41	82-371-366-01		Spring, Push slide lever		1
1-42	82-365-031-01		Washer, Case fastening		6
1-43	82-372-214-01		Arm R ass'y, Cassette lid	AD-1500	1
1-44	82-372-376-01		Cushion, Cassette lid	AD-1500	2
1-45	82-372-386-01		Felt 9mmϕ	AD-1500	2
1-46	82-372-250-01		Spring, Cassette lid	AD-1500	1
1-47	82-038-039-01		Binder, Lead wire		1
1-48	82-372-217-01		Arm L ass'y, Cassette lid	AD-1500	1
1-49	82-379-059-01		Buttom, Lid open	*	1
1-50	82-379-671-01		Knob, Volume C	*	2
1-51	82-379-670-01		Knob, Volume B	*	2
1-52	82-379-069-01		Knob, Volume A	*	2
1-53	82-379-687-01		Shield paper	*	1

EXPLODED VIEW–2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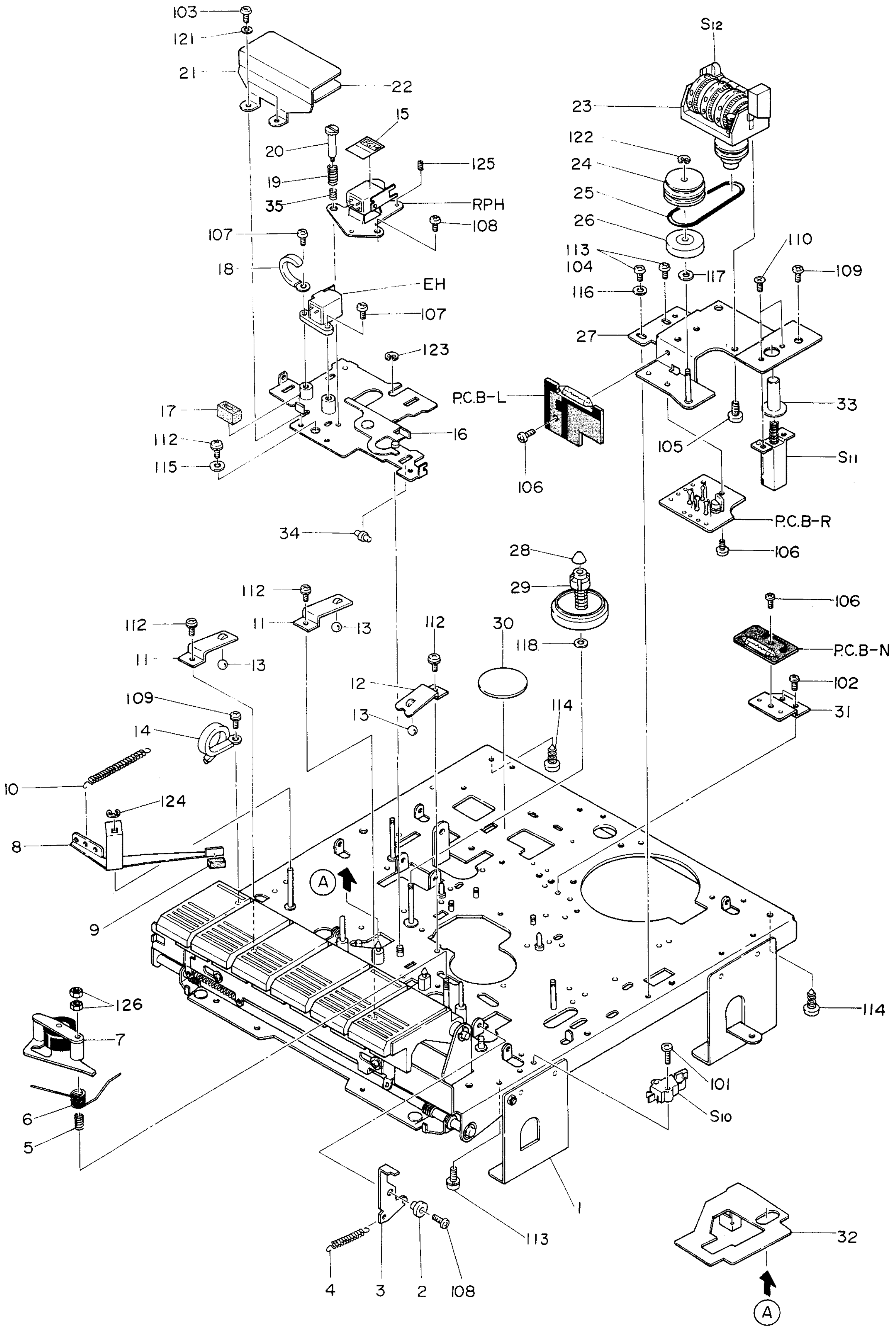
Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
2-1	82-379-288-01		Sub-chassis ass'y	*	1
2-2	82-372-228-01		Rec, lever C ass'y	AD-1500	1
2-3	82-379-292-01		Spring, Rec.	*	1
2-4	82-372-249-01		Jack bracket, Rear	AD-1500	1
2-5(a)	82-379-057-01		Jack panel EE, Rear	*	1
2-5(b)	82-379-073-01		Jack panel UK, Rear	*	1
2-6	82-375-662-01		Shield plate, Jack		1
2-7	82-375-299-01		Stud A, Circuit board		2
2-8	87-065-009-01		Earth terminal plate		1
2-9(a)	87-034-069-01		AC power cord (EE model only)		1
2-9(b)	87-034-847-01		AC power cord (UK model only)		1
2-10	87-058-009-01		Free-up belt		1
2-11	82-372-421-01		Cushion A, Meter	AD-1500	1
2-12	82-372-422-01		Cushion B, Meter	AD-1500	1
2-13	82-372-420-01		Bracket, Meter	AD-1500	1
2-14	82-380-701-01		Insulation fiber A		1
2-15	82-372-246-01		Cushion, Lamp	AD-1500	1
2-16	82-372-247-01		Bracket, Lamp circuit board	AD-1500	1
2-17	82-372-385-01		Collar, Power switch	AD-1500	2
2-18	82-372-384-01		Holder, Power switch	AD-1500	1
2-19	82-064-038-01		Wire clip		1
2-20	82-372-303-01		Jack bracket, Front	AD-1500	1
2-21	82-379-032-01		Jack panel, Front	*	1
2-22	82-374-238-01		Spacer, MIC jack		4
2-23	82-379-616-01		Shield paper	*	1
2-24	82-379-313-01		Metal fitting, Stop	*	1
2-25	82-372-414-01		Holder plate, Rec. switch	AD-1500	1
2-26	82-422-235-01		M cushion A		2
2-27	82-372-337-01		Tape running holder	AD-1500	1
2-28	82-379-616-01		Bushing rubber	*	1
2-29	82-372-061-01		Power button ass'y	AD-1500	1
2-30	82-379-315-01		Paper	*	1
2-31	82-372-026-01		Himeron cloth volume	AD-1500	1
2-32	82-379-704-01		Insulation fiber D	*	1
2-33	82-379-702-01		Insulation fiber B	*	1
2-34	87-085-094-01		Cord holder A		1
2-35	87-085-095-01		Cord holder B		1
2-36	82-372-383-01		Metal fitting cord holder	AD-1500	1
2-37	87-085-102-01		Nylon rivet		1
2-38	82-379-310-01		Red collar	*	2
2-39	87-056-008-01		Label, AC power cord (UK model only)		1

Ref. No.	Part No.	Description	Q'ty
2-101	87-263-091-11	V + 3-3	3
2-102	87-253-094-11	U + 3-6	26
2-103	87-253-075-01	U + 2.6-10	3
2-104	87-253-071-01	U + 2.6-4	2
2-105	87-253-092-11	U + 3-4	2
2-106	87-253-072-01	U + 2.6-5	2
2-107	87-233-073-01	Q + 2.6-6	6
2-108	87-233-071-01	Q + 2.6-4	2
2-109	87-253-095-01	U + 3-8	2
2-110	87-253-099-11	U + 3-15	2
2-111	87-480-093-11	VS + 3-5	7
2-112	87-430-169-11	VS + 4-6	2
2-113	87-341-073-01	VS + 3-8	1

Ref. No.	Part No.	Description	Q'ty
2-114	87-480-095-01	UT_1 + 2.6-6	1
2-115	87-341-091-01	UT_1 + 3-12	1
2-116	87-341-072-01	UT_1 + 2.6-5	2
2-117	87-410-315-01	W3-8-0.5	3
2-118	87-410-317-01	W3-10-0.8	2
2-119	87-081-018-01	FW3-10-1	3
2-120	87-450-412-11	LB-2	1
2-121	87-433-903-01	WTIE 2.6	1
2-122	87-441-009-01	STE-3	1
2-123	87-391-013-01	N 2.6	4
2-124	87-391-017-01	N-3	1

EXPLODED VIEW–3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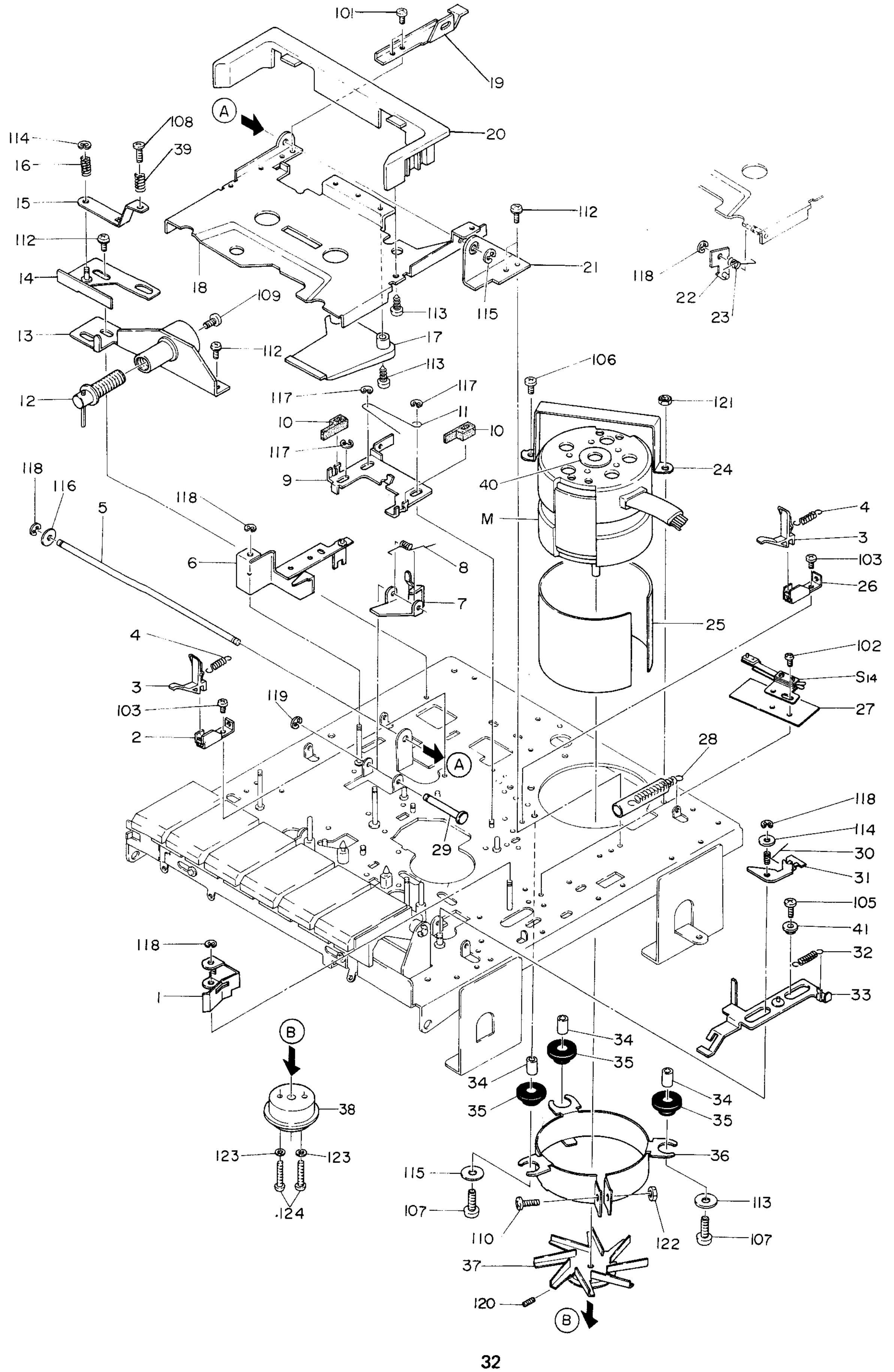
Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
3-1	82-379-201-01		Main chassis ass'y	*	1
3-2	82-371-455-01		Collar, Lid lock lever		1
3-3	82-379-249-01		Cassette lid lock lever A ass'y	*	1
3-4	82-379-284-01		Spring, Thing lever	*	1
3-5	82-372-334-01		Spring B, Pinch roller	AD-1500	1
3-6	82-379-237-01		Spring, Pinch lever	*	1
3-7	82-371-265-01		Pinch lever ass'y		1
3-8	82-372-306-01		Lever, Tension	AD-1500	1
3-9	82-372-307-01		Felt, Tension	AD-1500	1
3-10	82-372-308-01		Spring, Tension	AD-1500	1
3-11	82-379-229-01		Plate spring A, Actuating chassis	*	1
3-12	82-379-230-01		Plate spring B, Actuating chassis	*	1
3-13	82-215-341-01		Steel ball, 3/32		3
3-14	87-038-039-01		Wire binder		1
3-15	82-372-931-01		Label, Head	AD-1500	1
3-16	82-379-213-01		Actuating chassis	*	1
3-17	82-371-346-01		Rubber cushion		1
3-18	82-357-487-01		Holder, Lead wire		1
3-19	82-379-238-01		Spring, Rec/pb head adjuster	*	
3-20	87-379-231-01		Screw, Rec/pb head adjuster	*	1
3-21	87-379-232-01		Shield plate, Head	*	1
3-22	82-379-295-01		Cover, Shield plate	*	1
3-23	82-381-206-01		Counter		1
3-24	82-379-246-01		Pulley, Relay	*	1
3-25	82-379-298-01		Belt S, Counter	*	1
3-26	82-379-617-01		Magnet, Ring	*	1
3-27	82-379-243-01		Counter bracket ass'y	*	1
3-28	82-363-265-01		Cap, Take-up reel platform		1
3-29	82-371-445-01		Rewind reel platform ass'y		1
3-30	82-372-419-01		Felt 25mmφ	AD-1500	1
3-31	82-372-339-01		Bracket, Circuit board	AD-1500	1
3-32	82-372-416-01		Auxiliary plate C, Switch	AD-1500	1
3-33	82-379-030-01		Memory button ass'y	*	1
3-34	82-379-228-01		Roller, Actuating chassis	*	3
3-35	82-379-319-01		Plate spring, Slit	*	1

Ref. No.	Part No.	Description	Q'ty
3-101	87-253-036-01	V + 2-8	2
3-102	87-261-032-01	V + 2-3	2
3-103	87-263-070-01	V + 2.6-3	2
3-104	87-263-091-01	V + 3-3	1
3-105	87-253-094-11	U + 3-6	2
3-107	87-253-035-01	U + 2-6	2
3-108	87-253-073-01	U + 2.6-6	2
3-109	87-253-092-11	U + 3-4	2
3-110	87-233-033-01	Q + 2-4	2
3-111	87-480-093-11	VS + 3-5	1
3-112	87-481-071-01	VS + 2.6-4	3
3-113	87-480-095-11	VS + 3-8	2

Ref. No.	Part No.	Description	Q'ty
3-114	87-341-097-01	UT$_1$ + 3-12	2
3-115	87-410-214-01	W3-8-0.3	1
3-116	87-710-311-01	W2.6-7.5-0.5	1
3-117	87-081-036-01	TW2-5-0.2	1
3-118	87-081-202-01	TW1.5-4-0.3	1
3-119	87-082-005-01	NW2.5-5-0.3	1
3-120	87-421-303-01	SW-2	2
3-121	87-421-305-01	SW2.6	2
3-122	87-441-003-01	STE-1.5	1
3-123	87-441-008-01	STE-2.5	1
3-124	87-441-005-01	STE-2	1
3-125	87-374-034-01	SS2-5	2
3-126	87-391-006-01	N-2	2

EXPLODED VIEW-4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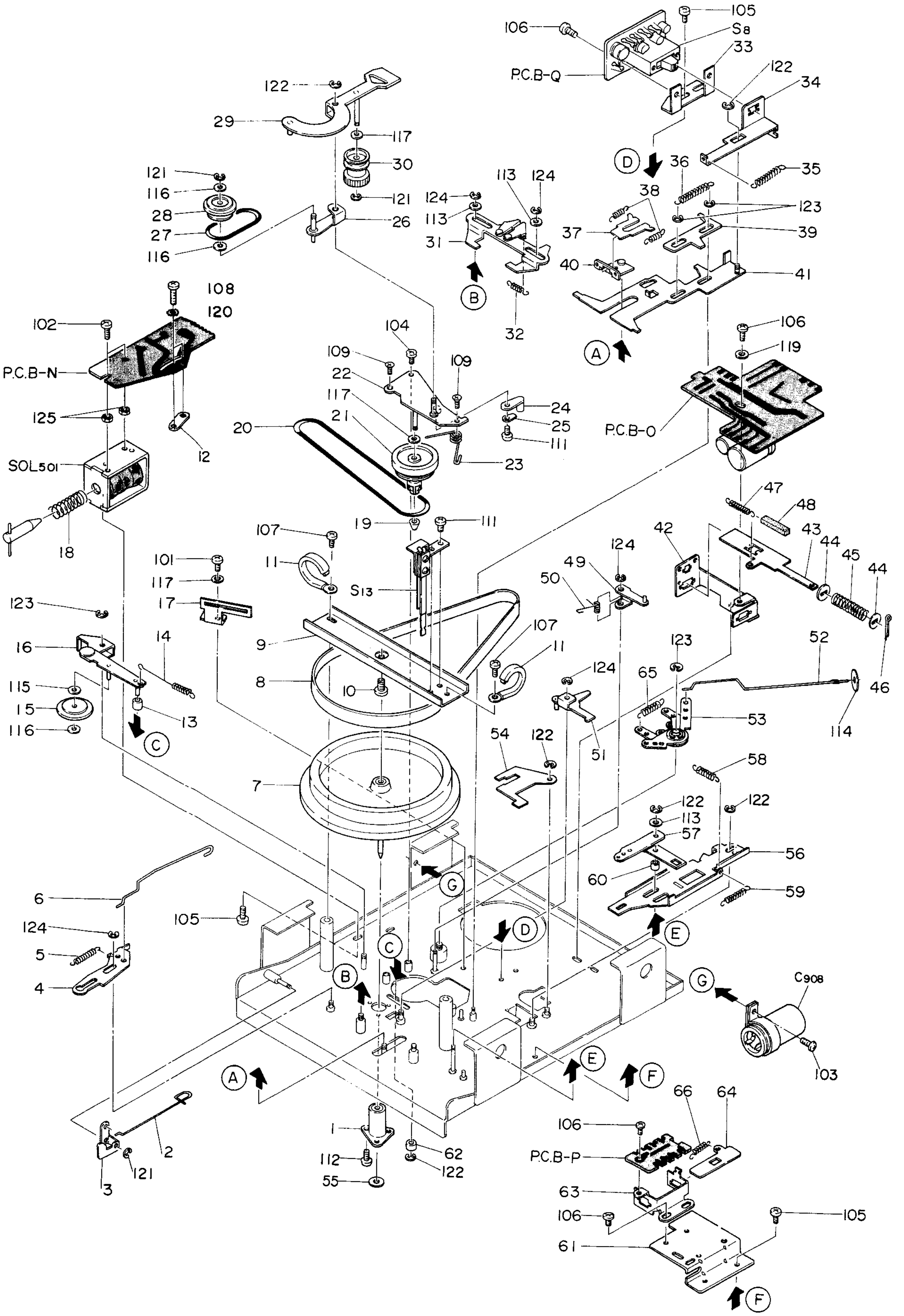
Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
4-1	82-372-347-01		Pause switch holder plate	AD-1500	1
4-2	82-372-234-01		Bracket L, Cassette holder	AD-1500	1
4-3	82-372-235-01		Cassette holder	AD-1500	2
4-4	82-372-252-01		Spring, Cassette holder	AD-1500	2
4-5	82-372-264-01		Spindle shaft, Cassette-up plate	AD-1500	1
4-6	82-372-366-01		Tape selector lever ass'y	AD-1500	1
4-7	82-372-232-01		Lever, Record–blocking	AD-1500	1
4-8	82-371-356-01		Spring, Record-blocking lever		1
4-9	82-372-240-01		Brake plate	AD-1500	1
4-10	82-372-410-01		Brake shoe	AD-1500	2
4-11	82-371-491-01		Spring, Brake		1
4-12	82-372-369-01		Damper shaft ass'y	AD-1500	1
4-13	82-372-361-01		Supporting plate ass'y, Damper	AD-1500	1
4-14	82-372-274-01		Lock auxiliary plate ass'y	AD-1500	1
4-15	82-372-365-01		Lock plate, CrO_2	AD-1500	1
4-16	82-372-372-01		Spring, CrO_2 lock plate	AD-1500	1
4-17	82-372-053-01		Window, Tape indicator	AD-1500	1
4-18	82-379-211-01		Cassette-up plate ass'y	*	1
4-19	82-372-364-01		Auxiliary plate	AD-1500	1
4-20	82-372-024-01		Cassette guide proper	AD-1500	1
4-21	82-372-288-01		Bracket, Cassette-up	AD-1500	1
4-22	82-372-310-01		Cassette-up lock plate ass'y	AD-1500	1
4-23	82-372-254-01		Spring, Cassette-up lock plate	AD-1500	1
4-24	82-379-311-01		Motor holder	*	1
4-25	82-379-630-01		Shield plate, Motor	*	1
4-26	82-372-233-01		Bracket R, Cassette holder	AD-1500	1
4-27	82-372-354-01		Insulation fibre	AD-1500	1
4-28	82-372-251-01		Spring, Cassette-up	AD-1500	1
4-29	82-371-349-01		Interlock lever shaft		1
4-30	82-372-309-01		Plate spring, Lock plate	AD-1500	1
4-31	82-370-262-01		Lock plate		1
4-32	82-371-374-01		Spring, Pause lever		1
4-33	82-371-307-01		Pause lever ass'y		1
4-34	82-371-318-01		Motor collar A		3
4-35	82-371-317-01		Motor cushion A		3
4-36	82-379-251-01		Motor holder	*	1
4-37	82-379-320-01		Motor pulley ass'y	*	1
4-38	82-379-322-01		Motor pulley	*	1
4-39	82-372-371-01		Adjuster spring	AD-1500	1
4-40	82-379-312-01		Motor cushion B	*	1
4-41	82-371-455-01		Lid lock lever collar		1

Ref. No.	Part No.	Description	Q'ty
4-101	87-263-031-01	V + 2-2	2
4-102	87-261-033-01	V + 2-4	2
4-103	87-263-070-01	V + 2.6-3	2
4-104	87-263-091-11	V + 3-3	1
4-105	87-253-072-01	U + 2.6-5	1
4-106	87-253-092-11	U + 3-4	1
4-107	87-253-097-11	U + 3-12	3
4-108	87-253-035-01	U + 2-6	1
4-109	87-253-033-01	U + 2-4	1
4-110	87-253-172-11	U + 4-12	1
4-111	87-480-071-01	VS + 2.6-4	1
4-112	87-480-093-11	VS + 3-5	6

Ref. No.	Part No.	Description	Q'ty
4-113	87-351-036-01	VT_1 + 2-8	4
4-114	87-410-314-01	W2.6-7.5-0.5	1
4-115	87-410-317-01	W3-10-0.8	3
4-116	87-410-315-01	W3-8-0.5	1
4-117	87-441-008-01	STE-2.5	4
4-118	87-441-005-01	STE-2.0	5
4-119	87-441-003-01	STE-1.5	1
4-120	87-373-037-01	SS2-10	2
4-121	87-391-017-11	N-3	1
4-122	87-391-034-11	N-4	1
4-123	87-421-303-01	SW-2	2
4-124	82-379-325-01	V + 2-18	2

EXPLODED VIEW – 5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Ref. No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
5-1	82-371-271-01		Flywheel shaft bearing ass'y		1
5-2	82-371-467-01		Coupling wire B		1
5-3	82-372-411-01		Plunger lever	AD-1500	1
5-4	82-372-241-01		Swing plate	AD-1500	1
5-5	82-379-284-01		Spring, Swing lever	*	1
5-6	82-372-341-01		Push rod A	AD-1500	1
5-7	82-379-302-01		Flywheel ass'y	*	1
5-8	82-371-342-01		Belt, Main		1
5-9	82-379-304-01		Bearing plate, Flywheel	*	1
5-10	82-331-107-01		Screw for thrust	TP-1004	1
5-11	82-038-039-01		Binder, Lead wire		2
5-12	82-379-323-01		Metal fitting, Cycle selector	*	1
5-13	82-379-280-01		Idler collar B	*	1
5-14	82-371-360-01		Spring, Play idler		1
5-15	82-379-300-01		Play idler ass'y	*	1
5-16	82-379-274-01		Idler arm ass'y	*	1
5-17	82-371-332-01		Guide plate		1
5-18	82-379-305-01		Spring, Plunger	*	1
5-19	82-363-265-01		Cap, Take-up reel platform		1
5-20	82-372-226-01		Belt L, Counter	AD-1500	1
5-21	82-379-264-01		Take-up reel platform	*	1
5-22	82-371-280-01		Reel platform base ass'y		1
5-23	82-371-357-01		Spring, Fast roller		1
5-24	82-371-250-01		Rewind roller ass'y		1
5-25	82-372-397-01		Holder, Rewind roller	AD-1500	1
5-26	82-371-284-01		Fast lever ass'y		1
5-27	82-371-343-01		Belt, FR		1
5-28	82-371-482-01		Fast roller ass'y		1
5-29	82-371-289-01		FR lever ass'y		1
5-30	82-371-256-01		FR pulley ass'y		1
5-31	82-371-299-01		FR slide plate ass'y		1
5-32	82-371-367-01		Spring, FR lever		1
5-33	82-379-236-01		Switch holder B	*	1
5-34	82-379-235-01		Switch auxiliary plate B	*	1
5-35	82-379-241-01		Spring C, Switch return	*	1
5-36	82-379-240-01		Spring, Brake actuating plate	*	1
5-37	82-379-242-01		Pressure plate, Actuating chassis	*	1
5-38	82-379-258-01		Pressure spring, Actuating chassis	*	2
5-39	82-371-321-01		Brake actuating plate B		1
5-40	82-379-219-01		Actuating chassis coupling plate ass'y	*	1
5-41	82-379-223-01		Brake actuating plate A ass'y	*	1
5-42	82-372-316-01		Selector switch holder	AD-1500	1
5-43	82-372-320-01		Auxiliary plate, Switch	AD-1500	1
5-44	82-372-323-01		Washer, Selector spring	AD-1500	2
5-45	82-372-318-01		Spring, Selector switch	AD-1500	1
5-46	82-372-321-01		Pin	AD-1500	1
5-47	82-372-317-01		Spring, Switch return	AD-1500	1
5-48	82-601-206-01		Spring cushion B		3
5-49	82-371-309-01		Center shifter ass'y		1
5-50	82-371-359-01		Spring, Center shifter		1
5-51	82-379-226-01		Review lever A ass'y	*	1
5-52	82-379-283-01		Push rod B	*	1
5-53	82-372-377-01		Relay terminal ass'y		1
5-54	82-379-234-01		Rec. release lever B	*	1
5-55	82-416-358-01		Poly-slider washer 6mmφ	AD-1200	1
5-56	82-379-262-01		Rec. lever A	*	1
5-57	82-371-327-01		Rec. lever B		1
5-58	82-371-414-01		Spring, Rec. release		1
5-59	82-371-363-01		Spring A, Rec. release		1
5-60	82-371-384-01		Collar		1
5-61	82-372-415-01		Switch holder A	AD-1500	1
5-62	82-379-279-01		Idler collar A	*	1
5-63	82-374-248-01		Switch holder C		1
5-64	82-381-220-01		Switch auxiliary plate B	*	1
5-65	82-372-380-01		Spring, Terminal	AD-1500	1
5-66	82-372-417-01		Spring B, Switch return	AD-1500	1

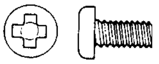
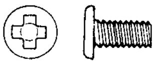
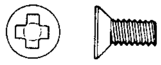
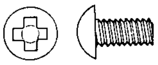
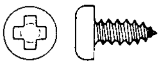
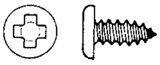
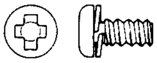
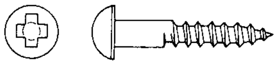
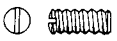
Ref. No.	Part No.	Description	Q'ty
1-101	87-253-097-01	U + 3-12	6
1-102	87-276-095-11	Y + 3-8	4
1-103	87-341-094-01	UT₁ + 3-5	2
1-104	87-341-097-01	UT₁ + 3-12	4

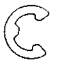
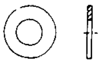
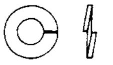
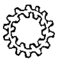
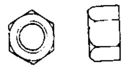
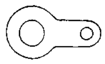
Ref. No.	Part No.	Description	Q'ty
1-105	87-341-095-01	UT₁ + 3-8	8
1-106	87-341-073-01	UT₁ + 2.6-6	1
1-107	87-351-074-01	VT₁ + 2.6-8	8
1-108	87-213-085-01	WV + 2.7-10	2

Ref. No.	Part No.	Description	Q'ty
5-101	87-263-070-01	V + 2.6-3	1
5-102	87-253-095-11	U + 3-8	2
5-103	87-253-096-11	U + 3-10	1
5-104	87-253-073-01	U + 2.6-5	1
5-105	87-253-092-11	U + 3-4	7
5-106	87-253-071-01	U + 2.6-4	6
5-107	87-253-090-11	U + 3-6	2
5-108	87-253-874-01	U + 2.6-8	2
5-109	87-233-071-01	Q + 2.6-4	2
5-110	87-480-033-01	VS + 2-4	1
5-111	87-480-071-01	VS + 2.6-4	3
5-112	87-480-072-01	VS + 2.6-5	3
5-113	87-410-314-01	W3-8-0.3	3

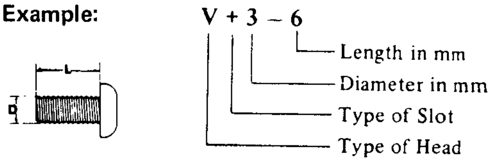
Ref. No.	Part No.	Description	Q'ty
5-114	87-410-305-01	W2-6-0.4	1
5-115	87-081-209-01	TW2-9-0.2	1
5-116	87-081-036-01	TW2.5-0.2	4
5-117	87-081-202-01	TW1.5-4-0.3	1
5-118	87-421-305-01	SW 2.6	1
5-119	87-081-197-01	FW 2.6-8-1	1
5-120	87-433-903-01	WTIE-2.6	2
5-121	87-441-003-01	STE-1.5	3
5-122	87-441-008-01	STE-2.5	6
5-123	87-441-099-01	STE-3	4
5-124	87-441-005-01	STE-2	5
5-125	87-391-036-11	N-5	2

HARDWARE NOMENCLATURE

V:	Pan head screw	
U:	Binding head screw	
Q:	Flat countersunk head screw	
Y:	Truss screw	
VT₁:	Pan head tapping screw	
UT₁:	Binding head tapping screw	
VS:	Pan head screw with spring washer	
WV:	Wooden screw	
SS:	Setscrew	

STE:	E ring (washer)	
W:	Washer	
FW:	Fibre washer	
TW:	Tefron washer	
SW:	Spring washer	
NW:	Nylon washer	
WTIE:	Crown washer	
N:	Nut	
LB:	Lug terminal plate	

Example:



Symbol No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
≪REC EQ CIRCUIT BOARD SECTION≫					
PCB-F	82-381-602-11		Rec EQ circuit board		1
L201,202,203, 204	82-372-670-01		Coil (3.3mH)		4
L205,206	82-379-606-01		Coil (4.7mH)	*	2
			<Resistors>		
R157,158	88-181-152-01		1.5kΩ 1/4W ±5% ELR		2
R255,256	88-181-392-01		3.9kΩ 1/4W ±5% ELR		2
			<Capacitors>		
C241,242	88-707-700-01		0.0033μF 50V Mylar		2
C 239, 240	88-707-830-01		0.022μF 50V Mylar		2
C233,234,237, 238	88-707-890-01		0.027μF 50V Mylar		4
C231,232,235, 236	88-707-860-01		0.068μF 50V Mylar		4
≪DOLBY-NR CIRCUIT BOARD SECTION≫					
PCB-G,H	82-379-608-11		DOLBY-NR circuit board	*	1
TR301,302, 303,304, 309,310	89-308-284-01		Transistor, 2SC-828 (R)		6
TR305,306, 307,308, 313,314	89-308-285-01		Transistor, 2SC-828 (S)		6
TR311,312	89-106-285-01		Transistor, 2SA-628 (F)		2
FET301,302	82-371-625-01		FET 2SK-30 (D)		2
D301,302,303, 304,311,312	87-026-066-01		Diode M-8513A (O)		6
D305,306,309, 310	88-051-060-01		Diode 1N-60		4
C307,308	82-371-647-01		Zener diode RD-7.5 (E)		2
SFR301,302	87-021-423-01		Semi-fixed resistor, 3.3kΩ-B		2
SFR303,304	87-021-421-01		Semi-fixed resistor, 1kΩ-B		2
	87-032-640-01		Connector (10P)		2
			<Resistors>		
R365,366	88-181-330-01		33Ω 1/4W ±5% ELR		2
R361,362	88-181-470-01		47Ω 1/4W ±5% ELR		2
R363,364	88-181-102-01		1kΩ 1/4W ±5% ELR		2
R341,342	88-181-122-01		1.2kΩ 1/4W ±5% ELR		2
R305,306,335, 336	88-181-182-01		1.8kΩ 1/4W ±5% ELR		4
R333,334	88-181-222-01		2.2kΩ 1/4W ±5% ELR		2
R325,326,359, 360	88-181-272-01		2.7kΩ 1/4W ±5% ELR		4
R309,310	88-181-332-01		3.3kΩ 1/4W ±5% ELR		2
R301,302,337, 338	88-181-682-01		6.8kΩ 1/4W ±5% ELR		4
R345,346,347, 348,349,350	88-181-822-01		8.2kΩ 1/4W ±5% ELR		6
R351,352	88-181-103-01		10kΩ 1/4W ±5% ELR		2
R343,344,367, 368	88-181-153-01		15kΩ 1/4W ±5% ELR		4
R321,322	88-181-223-01		22kΩ 1/4W ±5% ELR		2
R307,308,319, 320,	88-181-273-01		27kΩ 1/4W ±5% ELR		4
R311,312,327, 328,353,354	88-181-333-01		33kΩ 1/4W ±5% ELR		6
R329,330	88-181-393-01		39kΩ 1/4W ±5% ELR		2
R355,356	88-181-473-01		47kΩ 1/4W ±5% ELR		2
R303,304,357, 358	88-181-124-01		120kΩ 1/4W ±5% ELR		4
R313,314	88-181-154-01		150kΩ 1/4W ±5% ELR		2

Symbol No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
R315,316	88-181-184-01		180kΩ 1/4W ±5% ELR		6
R373,374	88-181-224-01		220kΩ 1/4W ±5% ELR		4
R317,318	88-181-234-01		230kΩ 1/4W ±5% ELR		2
R369,370,371 372	88-181-274-01		270kΩ 1/4W ±5% ELR		4
R323,324	88-181-474-01		470kΩ 1/4W ±5% ELR		2
R339,340	88-181-684-01		680kΩ 1/4W ±5% ELR		2
R353,354	88-131-333-01		33kΩ 1/4W ±5%		4
R331,332	82-371-645-01		3.3kΩ 1/4W ±1%		2
			<Capacitors>		
C303,304,305, 306	88-337-200-01		2.2μF 50V Electrolytic		4
C307,308,309, 310,317,318, 323,324,329, 330	88-335-110-01		10μF 16V Electrolytic		10
C335,336	88-335-120-01		100μF 16V Electrolytic		2
C321,322	88-333-510-01		47μF 10V Electrolytic		2
C333,334	87-015-099-01		0.33μF 10V Aluminum solid		2
C327,328	88-707-910-01		0.1μF Mylar		2
C319,320,325, 326,331,332	88-717-910-01		0.1μF Mylar		6
C301,302	88-202-850-01		0.047μF Ceramic		2
C315,316	82-371-643-01		4700pF PP		2
C311,312	82-371-642-01		5600pF PP		2
C313,314	82-371-641-01		0.27μF PP		2
≪DNL CIRCUIT BOARD SECTION≫					
PCB-I	82-379-610-11		DNL circuit board	*	1
TR401,402, 405,406, 407,408	89-308-284-01		Transistor, 2SC-828 (R)		6
TR403,404	89-308-285-01		Transistor, 2SC-828 (S)		2
D401,402,403, 404,405,406, 407,408,409, 410,411,412	87-026-066-01		Diode, M-8513A-(O)		12
	87-032-640-01		Connector (10p)		1
			<Resistors>		
R423,424,427, 428	88-181-681-01		680Ω 1/4W ±5% ELR		4
R407,408	88-181-152-01		1.5kΩ 1/4W ±5% ELR		2
R411,412	88-181-182-01		1.8kΩ 1/4W ±5% ELR		2
R419,420	88-181-392-01		3.9kΩ 1/4W ±5% ELR		2
R409,410,429, 430	88-181-562-01		5.6kΩ 1/4W ±5% ELR		4
R431,432	88-181-682-01		6.8kΩ 1/4W ±5% ELR		2
R413,414	88-181-153-01		15kΩ 1/4W ±5% ELR		2
R425,426,435, 436	88-181-223-01		22kΩ 1/4W ±5% ELR		4
R433,434	88-181-124-01		120kΩ 1/4W ±5% ELR		2
R401,442	88-181-154-01		150kΩ 1/4W ±5% ELR		2
R415,416	88-181-184-01		180kΩ 1/4W ±5% ELR		2
R439,440	88-181-224-01		220kΩ 1/4W ±5% ELR		2
R403,404,437, 438	88-181-274-01		270kΩ 1/4W ±5% ELR		4
R417,418	88-181-684-01		680kΩ 1/4W ±5% ELR		2
R421,422	88-183-334-01		330kΩ 1/4W ±5% NL		2
R405,406	82-379-674-01		1.69kΩ 1/4W ±2%	*	2
			<Capacitors>		
C401,402	88-337-100-01		1μF 50V Electrolytic		2
C421,422,425, 426	88-336-500-01		4.7μF 25V Electrolytic		4

Symbol No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
C407,408	88-507-500-01		270pF Styrol		2
C413,414	88-507-570-01		680pF Styrol		2
C409,410	88-707-630-01		1500pF Mylar		2
C403,404	88-707-640-01		1800pF Mylar		2
C411,412	88-707-600-01		2200pF Mylar		2
C405,406,419, 420	88-707-720-01		4700pF Mylar		4
C415,416,417, 418	88-707-830-01		0.022μF Mylar		4
C423,424	88-717-830-01		0.022μF Mylar		2
≪JACK-2 CIRCUIT BOARD SECTION≫					
PCB-J	82-379-612-21		Jack-2 circuit board	*	1
TR201,202	89-310-006-01		Transistor, 2SC-1000 (BL)		2
VR701	82-379-680-01		Volume 1kΩ-B (LH TAPE BIAS)	*	1
J4	87-032-524-01		5P DIN jack (DIN, REC/PB)		1
J7,8	87-032-525-01		2P pin jack (LINE OUT)		1
			<Resistors>		
R201,202	88-131-330-01		33Ω 1/4W ±5%		2
R205,206	88-131-102-01		1kΩ 1/4W ±5%		2
R709	88-131-182-01		1.8kΩ 1/4W ±5%		1
R263,264	88-131-222-01		2.2kΩ 1/4W ±5%		2
R207,208	88-131-183-01		18kΩ 1/4W ±5%		2
R215	88-131-223-01		22kΩ 1/4W ±5%		1
R213,214	88-131-104-01		100kΩ 1/4W ±5%		2
R209,210	88-131-564-01		560kΩ 1/4W ±5%		2
R203,204	88-131-225-01		2.2MΩ 1/4W ±5%		2
R211,212	88-176-395-01		3.9MΩ 1/4W ±5%		2
			<Capacitors>		
C201,202,203, 204	88-337-500-01		4.7μF 50V Electrolytic		4
C205	88-336-510-01		47μF 25V Electrolytic		1
C207,208	88-212-270-01		39pF 50V Ceramic		2
C206	88-205-910-01		0.1μF 25V Ceramic		1
≪LAMP CIRCUIT BOARD SECTION≫					
PCB-K	82-379-671-01		LAMP circuit board	*	1
PL1,2,3,4	82-372-617-11		Pilot lamp 6.3V 70mA (RECORD, DOLBY-NR DNL, CrO_2)		4
≪COUNTER LAMP CIRCUIT BOARD SECTION≫					
PCB-L	82-379-672-01		Counter lamp circuit board	*	1
PL6	82-372-617-11		Pilot lamp 6.3V 70mA (COUNTER)		1
≪LED CIRCUIT BOARD SECTION≫					
PCB-M	82-379-661-01		LED circuit board	*	1
D213	87-026-086-01		Light emitting diode SLP-614 (ORG)		1
D214	87-026-083-01		Light emitting diode SLP-114 (RED)		1
≪CASSETTE LAMP CIRCUIT BOARD SECTION≫					
PCB-N	82-379-670-01		Cassette lamp circuit board	*	1
PL5	82-372-617-11		Pilot lamp 6.3V 70mA (CASSETTE)		1
≪AUTO-STOP/CrO_2 SWITCH CIRCUIT BOARD SECTION≫					
PCB-O	82-381-620-11		Auto-stop/CrO_2 switch circuit board		1
TR-501	89-106-844-01		Transistor, 2SA-684 (R)		1
TR-502,504	89-309-456-01		Transistor, 2SC-945L (P)		2
D501,502,503, 508,509	87-027-039-01		Diode 10D-1		5
D504,505,506	87-027-025-01		Diode 1S-1212		3
S6	87-031-239-01		Slide switch (CrO_2/automatic selector switch)		1
	87-033-092-01		PCB tab (A)		2

Symbol No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
			<Resistors>		
R501,503	88-131-102-01		1kΩ 1/4W ±5%		2
R502	88-131-122-01		1.2kΩ 1/4W ±5%		1
R507	88-131-222-01		2.2kΩ 1/4W ±5%		1
R513	88-131-332-01		3.3kΩ 1/4W ±5%		1
R505,518	88-131-562-01		5.6kΩ 1/4W ±5%		2
R509	88-131-822-01		8.2kΩ 1/4W ±5%		1
R504,515,516	88-131-103-01		10kΩ 1/4W ±5%		3
R514	88-131-104-01		100kΩ 1/4W ±5%		1
R506	88-131-124-01		120kΩ 1/4W ±5%		1
			<Capacitors>		
C510	88-337-390-01		0.33μF 50V Electrolytic		1
C501	88-344-524-01		470μF 35V Electrolytic		1
C506	88-336-110-01		10μF 25V Electrolytic		1
C502	88-335-310-01		33μF 16V Electrolytic		1
C505,509	88-335-510-01		47μF 16V Electrolytic		2
C504	88-332-320-01		330μF 6.3V Electrolytic		1
C503,508	88-214-810-01		0.01μF Ceramic		2
C507	88-205-850-01		0.047μF Ceramic		1
≪STOP-MUTING CIRCUIT BOARD SECTION≫					
PCB-P	82-381-621-11		Stop muting circuit board		1
S7	87-031-239-01		Slide switch (STOP MUTING)		1
≪FF/REW MUTING CIRCUIT BOARD SECTION≫					
PCB-Q	82-379-615-01		FF/REW muting circuit board	*	1
TR601,602	89-402-274-01		Transistor, 2SD-227 (R)		2
TR603	89-313-647-01		Transistor, 2SC-1364 (7)		1
D601	87-026-066-01		Diode M-8513 (O)		1
S8	82-379-626-01		Slide switch (FF/REW MUTING)	*	1
			<Resistors>		
R605	88-181-330-01		33Ω 1/4W ±5% ELR		1
R603	88-181-680-01		68Ω 1/4W ±5% ELR		1
R601,602	88-181-821-01		820Ω 1/4W ±5% ELR		2
R606	88-181-562-01		5.6kΩ 1/4W ±5% ELR		1
R604	88-131-104-01		100kΩ 1/4W ±5% ELR		1
			<Capacitor>		
C601	88-332-220-01		220μF 6.3V Electrolytic		1
≪AUTO-STOP DETECTION CIRCUIT BOARD SECTION≫					
PCB-R	82-379-614-01		Auto-stop detection circuit board	*	1
TR503	89-309-456-01		Transistor, 2SC-945L (P)		1
IC501	87-027-160-01		Hall IC, DN-835		1
D510	87-026-069-01		Zener-diode, WZ-052		1
			<Resistors>		
R508,512	88-131-332-01		3.3kΩ 1/4W ±5%		2
R511	88-181-122-01		1.2kΩ 1/4W ±5% ELR		1
R510	88-181-152-01		1.5kΩ 1/4W ±5% ELR		1
R512	88-140-182-01		1.8kΩ 1/2W ±5%		1
≪BIAS OSC CIRCUIT BOARD SECTION≫					
PCB-S	82-379-673-11		BIAS OSC circuit board	*	1
TC701,702	87-011-079-01		Trimer (30pF)		2
OSC UNIT	82-372-658-01		OSC unit		1
L107,108	82-371-644-01		Coil (22mH)		2
			<Resistors>		
R706	88-131-471-01		470Ω 1/4W ±5%		1
R703,707	88-131-561-01		560Ω 1/4W ±5%		2
R704,708	88-131-681-01		680Ω 1/4W ±5%		2
R705	88-131-821-01		820Ω 1/4W ±5%		1
R177,178	88-181-103-01		10kΩ 1/4W ±5% ELR		2
R701	88-141-151-01		150Ω 1/2W ±5%		1
R702	88-141-331-01		330Ω 1/2W ±5%		1

Symbol No.	Part No.	Part No. Changed to	Description	Common Model	Q'ty
			<Capacitors>		
C702	88-344-120-01		100µF 35V Electrolytic		1
C701	88-238-450-01		150pF Ceramic		1
C155,156	88-238-410-01		100pF Ceramic		2
≪MOTOR CIRCUIT BOARD SECTION≫					
PCB-T	82-379-666-01		Motor circuit board	*	1
SOL501	82-372-677-21		Solenoid		1
			<Capacitor>		
C908	82-379-679-01		16 + 4µF 50V Electrolytic	*	1
≪DIN OUT LEVEL VOLUME CIRCUIT BOARD SECTION≫					
P.C.B-U	82-379-667-01		DIN OUT LEVEL VOLUME circuit board		
VR107,108 S9	82-372-668-01		Volume 10kΩ-A with switch (DIN OUT LEVEL)		
≪MISCELLANEOUS≫					
D507	82-379-640-01		Right emitting diode, TLG-105	*	1
T901	82-379-698-01		Power transformer (EE model only)	*	1
T901	82-379-699-01		Power transformer (UK model only)	*	1
S10	87-031-288-01		Micro switch (PAUSE)		1
S11	87-031-330-01		Push switch (MEMORY)		1
S12	82-381-206-01		Counter (MEMORY)		1
S13	82-379-646-01		Leaf switch (REW)	*	1
S14	82-372-651-01		Leaf switch (Cassette detection)		1
S15	87-031-342-01		Push switch (POWER)		1
S16	87-031-343-01		Slide switch (VOLTAGE SELECTOR)		1
VR5,6	82-372-609-01		Slide volume 10kΩ A x 2 (LINE OUT)		1
J5,6	82-372-633-01		2P pin jack w/switch (LINE IN)		1
RPH	82-379-631-01		REC/PB head	*	1
EH	87-046-088-11		Erase head		1
LM201,202	82-379-695-01		Level meter	*	2
M	82-379-628-01		Motor (24V)	*	1
F1,2	87-035-079-01		Fuse, 200mA "T"		2
	87-057-774-01		Fuse label, 200mA "T"		2
F3	87-035-063-01		Fuse 630mA "T"		1
	87-057-798-01		Fuse label 630mA "T"		1
F4	87-035-127-01		Fuse 1A		1
	87-057-762-11		Fuse label 1A "T"		1
	82-379-678-01		Fuse holder (4P)	*	1
	87-034-069-01		AC power cord (EE model only)		1
	87-034-847-01		AC power cord (UK model only)		1
	82-372-657-01		Connector (2P) (F)		1
	82-372-656-01		Connector (2P) (M)		1
	82-379-691-01		3P connector ass'y	*	1
	82-379-689-01		3P connector ass'y	*	1
	82-379-690-01		16 p connector ass'y	*	1
	82-379-688-01		16 p connector ass'y	*	1
	82-379-694-01		12 p connector ass'y	*	1
	82-379-693-01		12 p connector ass'y	*	1
	87-033-013-01		Lug terminal plate, 1L4P		1
	82-372-648-01		Fasten ass'y (D507)		1
	82-372-649-01		Fasten ass'y (D507)		1
			<Resistor>		
R517	88-131-102-01		1kΩ 1/4W ±5%		1
			<Capacitors>		
C101	88-215-660-01		0.0022µF Ceramic		1
C170	88-205-850-01		0.047µF Ceramic		

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